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Regulated and Unregulated Exhaust Emissions from Malfunctioning Non-Catalyst and Oxidation Catalyst Gasoline Automobiles

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San Antonio, TX

Prepared for

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Ann Arbor, MI

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REGULATED AND UNREGULATED EXHAUST EMISSIONS FROM MALFUNCTIONING NON-CATALYST AND OXIDATION CATALYST GASOLINE AUTOMOBILES

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Contract No. 68-03-2499

EPA Project Officer: Robert J. Garbe

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Emission Control Technology Division
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January 1980

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Publication No. EPA-460/3-80-003

ABSTRACT

This report describes the laboratory effort to characterize regulated and unregulated exhaust emissions from non-catalyst and oxidation catalyst-equipped gasoline automobiles operating under malfunction conditions. One non-catalyst and four catalyst-equipped automobiles were evaluated over three driving schedules in the unmodified and in four engine and/or emission control system malfunction configurations. Exhaust emission constituents measured, in addition to the currently regulated emissions, include: particulates, sulfates, aldehydes, sulfides, amines, metals and several additional elements and compounds.

FOREWORD

This project was initiated by the Technology Assessment and Evaluation Branch, Environmental Protection Agency, 2565 Plymouth Road, Ann Arbor, Michigan 48105. The engineering and analytical effort on which this report is based was accomplished by the Department of Emissions Research of Southwest Research Institute, 6220 Culebra Road, San Antonio, Texas 78284. This project, authorized by Contract 68-03-2499, was initiated on December 6, 1976 and was completed April 6, 1979.

The SwRI Project Leader was Mr. Charles Urban who supervised all vehicle testing, data analyses and reporting. Mr. Harry Dietzmann was in charge of all unregulated emissions procedural development related activities that were involved in this project. Mr. Karl Springer was Project Manager and was involved in the initial technical and fiscal negotiations and all subsequent major project decisions.

The Project Officer throughout the entire project was Mr. Robert Garbe of the Technology Assessment and Evaluation Branch, Environmental Protection Agency. Mr. Garbe played an active part in all major project areas. Dr. Ronald Bradow and members of his staff, of the the Environmental Protection Agency at Research Triangle Park in North Carolina, provided considerable technical and other support relative to the analyses of the unregulated emissions.

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SUMMARY

The major objective of this project was to evaluate the effects of malfunction conditions on exhaust emissions from a non-catalyst and oxidation catalyst-equipped gasoline automobiles. These evaluations involved analyzing the exhaust for many unregulated compounds and elements in addition to the currently regulated emissions.

This study involved five mid-size automobiles built by three of the American manufacturers. One of the automobiles was a 1977 model with a six cylinder engine which did not have a catalytic converter. The other four were 1978 models with V-8 engines and oxidation catalytic converters. The 1977 model and two of the four 1978 models had supplementary air injection into the exhaust manifold.

Following final selection of the malfunction conditions, each of the five automobiles was evaluated in the unmodified and in four different malfunction configurations. Malfunction conditions evaluated included: rich fuel-to-air ratio at idle, ignition misfire, disabled EGR, and either idle with the air pump disconnected or high oil consumption. With each automobile, a total of four evaluations were conducted in the unmodified configuration and two evaluations were conducted in each of four malfunction configuration.

Unregulated emission compounds measured included: sulfates, particulates, metals and other elements, aldehydes, cyanides, sulfides, organic amines, nickel carbonyl, n-nitrosodimethylamine, ammonia and nitrous oxide. A number of the analytical procedures for these compounds were developed specifically for use in this and several other related projects.

The three test sequences involved in this project were the light-duty Federal Test Procedure (FTP), the congested freeway driving schedule and the highway fuel economy driving schedule. The basic requirements specified in the Code of Federal Regulations for certification of light-duty vehicles were followed for all three of these driving schedules.

A significant data base for both regulated and unregulated emissions was generated in this project. To facilitate their review and usage, these data were analyzed to the extent applicable and are presented in several different formats in this report. Highest values detected, for all cars operating under all test cycles and all malfunctions, are summarized as follows:

	Maximum Emission Rate, mg/km			
	Non-Catalyst		Oxi.-Catalyst	
Emissions	Unmod.	Malf.	Unmod.	Malf.
Hydrocarbons[a]	730	10,800	320	2,300
Carbon Monoxide[a]	11,100	24,700	5,500	52,900
Oxides of Nitrogen[a]	1,200	2,300	1,200	4,200
Total Particulates[a]	31	48	8	18
Sulfate	0.7	1.3	8	17
Aldehydes & Ketones	17	228	3	13
Organic Sulfides	0.2	0.4	0.5	2.1
Organic Amines	<0.1	0.2	<0.1	0.1
Ammonia	3	3	5	57
Cyanides & Cyanogen	2.4	7.1	0.6	6.2
Hydrogen Sulfide	0.1	0.5	0.1	4.3
Nickel Carbonyl	0.00	0.00	0.00	0.00
Nitrous Oxide	4	4	41	70

---

[a] Values for the FTP are given for the three regulated emissions and total particulates. For HC, CO and total particulates, the FTP values were the maximum values.

I. INTRODUCTION

This report describes the effort to characterize regulated and unregulated exhaust emissions from non-catalyst and catalyst-equipped light-duty gasoline vehicles operating in the unmodified and under malfunction conditions. This is the first project to be completed from among several related projects at SwRI involving the evaluation of a large number of unregulated emissions from gasoline automobiles.

A. Project Objective

The major objective of this project was to evaluate the effects of engine malfunction conditions on exhaust emissions from a non-catalyst and from oxidation catalyst-equipped automobiles. Emissions evaluated included the three currently regulated emissions (HC, CO and NO_x) along with a significant number of currently unregulated compounds (e.g., sulfates, sulfides, aldehydes, amines, etc.).

B. Emissions Measurement Procedure

The emissions measurement procedures utilized in this project ranged from those procedures routinely used (HC, CO, NO_x, sulfate, etc.) to procedures that required considerable research and experimentation before they became operational (organic sulfides, amines, etc.). The compounds or compound groups evaluated, along with the sampling method used, were as follows:

Sampling Method	Compounds Evaluated
Bag	HC, CO, NO_x, CO_2, Individual HC, Nitrous Oxide and Nickel Carbonyl
Filter	Sulfates, Particulates, Metals and other Elements
Impinger	Cyanides, Aldehydes, Hydrogen Sulfide, Ammonia and Organic Amines
Trap	Carbonyl Sulfide, Organic Sulfides and DMNA

A number of the procedures for measuring unregulated emissions were developed in another project and reported in an interim report.(1)*

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* Superscript numbers in parenthesis designate references at end of report.

C. Vehicles Evaluated

Five automobiles were utilized in this project; four with and one without an oxidation catalytic converter. Included were a 1977 AMC Pacer, two 1978 Chevrolet Malibus (one certified for sale in California), a 1978 Ford Granada and a 1978 Ford Mustang II. The two Chevrolet Malibus had pelleted catalysts and the two Ford automobiles had monolithic catalysts. The AMC Pacer did not have a catalyst.

D. Malfunction Conditions Evaluated

The automobiles were evaluated in the unmodified configuration (i.e., tuned-up to manufacturer's specifications) and under various malfunction conditions. Potential malfunction conditions for this project were identified by the EPA Project Officer after an extensive examination of available data on malfunction conditions. A series of tests using a representative vehicle was then conducted to identify the "best" malfunction candidates for use in this project. Conditions considered were: rich operation, use of leaded fuel, engine misfire, EGR failure, air pump failure, high lubricant consumption, ignition timing advance and retard, and various combinations. With the exception of the use of leaded fuel, all the preceding individual malfunction conditions were evaluated in either the malfunction screening or the vehicle testing phases of this project. Leaded fuel, although a condition of concern, was not evaluated due to lack of emission measurement methods for halogen compounds at the time this project was initiated.

E. Vehicle Testing

Each of the five vehicles was tested in the unmodified configuration (i.e., tuned-up to manufacturer's specifications) and in each of four malfunction conditions. The test sequence included the Light-Duty Federal Test Procedure,(2) the Congested Freeway Driving Schedule(3) and the Highway Fuel Economy Driving Schedule.(4) Preconditioning of the vehicle prior to testing was conducted in accordance with the 55 mph Alternate Mileage Accumulation Procedure.(5) To the extent practical, all specified unregulated exhaust constituents were sampled and analyzed during every test.

F. Project Reviews

A number of meetings, discussions, and reviews were held during the course of this project with the Project Officer and the other individuals at EPA involved in this or related projects. This project is the first to be completed out of the several projects being conducted at this laboratory which involve extensive measurements of unregulated emissions from gasoline powered vehicles. The primary project planning meeting was held as SwRI on March 22 and 23, 1977. Attendance at the March meeting included: Mr. Robert Garbe and Dr. Joseph Somers from the EPA and Mr. Charles Urban, Mr. Harry Dietzmann and Mr. Karl Springer from SwRI. Significant modifications to the original scope of work were discussed during this meeting. A meeting was held at SwRI on July 14 and 15, 1977, to coordinate the various project efforts involving measurement of unregulated emissions. In attendance at this meeting were: Dr. Joseph Somers, Mr. Ralph Stahman and Mr. Jack Wagman from the EPA-AA, Dr. Ronald Bradow and Mr. Frank Black from the EPA-RTP, and Messrs. Karl Springer, Charles Hare, Harry Dietzmann, Sherrill Martin and Charles Urban from SwRI. A projects status review meeting was held at SwRI on December 7, 1977 with representatives from SwRI, EPA-AA, EPA-RTP and EPA-Washington in attendance.

II. GENERAL EQUIPMENT, INSTRUMENTS, PREPARATION AND PROCEDURES

This section describes the vehicles, the fuel and lubricant, the facilities and the general instrumentation and procedures utilized in this project. The overall sampling systems for the unregulated emissions are also discussed.

A. Vehicles

Five new gasoline powered automobiles were evaluated in this project. All five automobiles (cars) are described in Table 1 and three of the five are shown in Figure 1. The 1977 AMC Pacer was the only one of the five cars which did not use an oxidation catalytic converter (catalyst). As a matter of fact, two AMC models using the 258/6 engine were the only domestically produced gasoline automobiles in 1977 which did not use a catalyst.

The five cars were obtained through standard lease agreements and came equipped with the normally obtained options; such as automatic transmission, power steering and brakes, and steel radial tires. Assurance was also made that these automobiles came equipped with the standard rear-axle ratio and standard size tires.

Difficulties were initially encountered with the Ford Granada. Upon receipt, it had unacceptable surging during normal operation. The primary cause was diagnosed as being due to a defective EGR valve. The Service Advisor at the local San Antonio Ford dealer said the EGR valve would have to be special ordered and would take a couple of weeks to get. It ended up taking almost a month to get the EGR valve and return of the Granada. With the tune-up and repair performed, the Granada operated satisfactorily. No further engine or emission control difficulties were encountered with any of the five automobiles evaluated.

B. Fuel and Lubricant

Throughout this project a single batch of Chevron UL-CQ26B1 unleaded gasoline, type provided to auto manufacturers for emissions durability tests, was used for all testing. This gasoline, described in Table 2, was made in accordance with the specifications outlined in MSAPC Advisory Circular No. A/C 26B1 and contained no measurable manganese. The hydrogen to carbon ratio was 1.89 and the SwRI identification number was EM-344.

The engine lubricant used throughout this project was Exxon Uniflow 10W40 motor oil. This motor oil, in addition to having a significant sales volume, contained an additive for reducing engine friction. Indications at the time were that many or most major motor oil manufacturers were planning to incorporate friction additives into their motor oils.

TABLE 1. AUTOMOBILES EVALUATED

Project Car Number	Vehicle					
	Year	Make	Model	Body Type	ID or Serial Number	GVWR, Kg
11	1977	AMC	Pacer	2-dr	A7C667 C233194	1962
12	1978	Chev.	Malibu	2-dr	1W27U8R416330	2040
13	1978	Chev.	Malibu (Cal)	2-dr	1W27U8Z434207	2052
14	1978	Ford	Granada	4-dr	8W82F117400	2101
15	1978	Ford	Mustang II	2-dr	8F02F187610	1857

Project Car Number	Engine		Emission Controls		
	CID/Cyl	Family	Oxidation Catalyst	Air Pump	EGR
11	258/6	I-2	None	Yes	Yes
12	305/8	810Y2 8BCV	Pelleted	No	Yes
13	305/8	810Y2V 8BCV	Pelleted	Yes	Yes
14	302/8	302 "A" (1x95)	Monolith	Yes	Yes
15	302/8	302 "D" (1x95)	Monolith	No	Yes

Project Car Number	Chassis Dynamometer Settings[a]			
	Inertia, Kilograms	Power, Kilowatts	Inertia, Pounds	Power, Horsepower[b]
11	1590	9.2	3500	12.3
12	1590	8.0	3500	10.7
13	1590	8.0	3500	10.7
14	1810	9.8	4000	13.2
15	1590	9.2	3500	12.3

Note: All five automobiles were equipped with:

- Automatic Transmission
- Power Steering and Brakes
- Air Conditioning
- Steel-Belted Radial Tires

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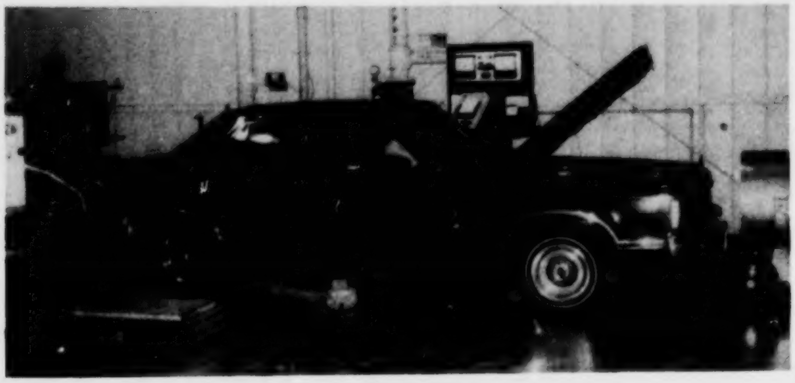
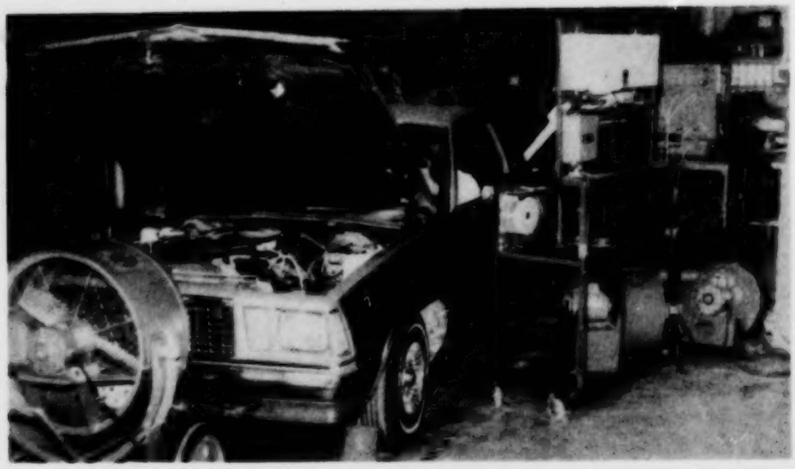
[a] Same as settings used in EPA certification of each automobile, except for the Granada.

[b] Includes the increase for air conditioning.

1977 AMC Pacer



1978 Ford Granada



1978 Chevrolet Malibu

Figure 1. Representative views of automobiles evaluated.

TABLE 2. DESCRIPTION OF CHEVRON UL-CQ26B1 UNLEADED GASOLINE

	Test Method	
Availability Date		April 24, 1978
Tank No.		94
Gallons		801,901
Gravity, °API at 60°F	ASTM D 1298	58.4
Research Octane No.	ASTM D 2699	91.6
Motor Octane No.	ASTM D 2700	83.2
Sensitivity		8.4
Lead, g/Gal.	ASTM D 3237	0.001
Sulfur, Wt %	X-Ray - ASTM D 2622 (Modified)	0.029
Phosphorus, g/Gal	ASTM D 3231	0.0002
Manganese, g/Gal.	EAM 128-74	0.001
Gum, mg/100 mℓ	ASTM D 381	
Unwashed		85
Washed		0
Reid Vapor Pressure, psi	ASTM D 323	8.9
Distillation, °F (% Evaporated)	ASTM D 86	
IBP		97
10%		129
50%		212
90%		328
EP		386
Recovery, %		97.5
Residue, %		1.0
Loss, %		1.5
Acidity of Residue	ASTM D 1093	Pass
Hydrocarbons, Vol %	ASTM D 1319	
Aromatics		28
Olefins		8
Saturates		64
Benzene, Vol %	Chevron Research Technique	2.0
Water and Sediment, Vol %	ASTM D 2709	<0.001
Oxidation Stability, Hr.	ASTM D 525	24+
Copper Corrosion	ASTM D 130	1A

Note: These inspection data were provided by the Chevron Research Company.

C. Dynamometer and CVS System

A Clayton Model ECE-50 chassis dynamometer with a belt-driven variable-inertia flywheel system, was utilized for all transient testing. The belt-driven inertia system simulated equivalent weight of vehicles from 680 kg (1500 lbs) to 2495 kg (5500 lbs) in 115 kg (250 lbs) increments to 1360 kg and 225 kg increments about 1360 kg.

The constant volume sampler (CVS) used for these evaluations was SwRI CVS Number 2. This unit has a nominal capacity of 9.2 m^3/min (325 cfm). A nominal 200 mm (8 inch) diameter by 3 m (10 feet) long dilution tunnel was used between the intake filter and the CVS to enable sampling of sulfate and particulate.

Partial views of the chassis dynamometer, the dilution tunnel and the intake to the CVS can be seen in previous Figure 1 and subsequent Figure 4. Both the dynamometer and the CVS were calibrated, maintained and operated in accordance with the manufacturer's instructions and the appropriate sections of the Code of Federal Regulations applicable to light-duty vehicles.(2)

In addition to the 142 m^3/min (5000 cfm) cooling fan placed in front of the automobiles, 42 m^3/min (1500 cfm) blowers were available to cool each rear wheel and to blow the heat from the exhaust pipe away from the automobiles gasoline tank. These additional blowers were used only during the SET and HFET driving cycles.

D. Exhaust Sampling and Analysis

A pictorial schematic of the exhaust and sampling system is shown in Figure 2 with dimensional details given in Figure 3. This system is in accordance with the guidelines established in various projects conducted at SwRI for the EPA. The major difference between this system and similar systems used in other projects is the number of sampling probes and systems required to collect all of the required unregulated emission samples. This is illustrated in the several views of the system shown in Figure 4. View A shows an overall view of the entire system in operation during an actual test. View B shows the system used to continuously record the dilute HC, CO, NO_x and CO_2, the O_2 in the raw exhaust and the catalyst temperature. View C shows a significant portion of the sampling systems for the unregulated emissions. View D provides another view of the overall set-up with operators in place as required to operate all of the sampling systems. The various sampling systems are numbered on Views C and D and are identified beside these views.

This section has described the dilution tunnel and provided some insight into the overall sampling system assembly. More detailes on each of the individual sampling systems for unregulated emissions are given in Section III of this final report.

E. Instrumentation for Regulated Emissions and Engine Parameters

Bagged samples of the dilute exhaust were evaluated for HC, CO, NO_x and

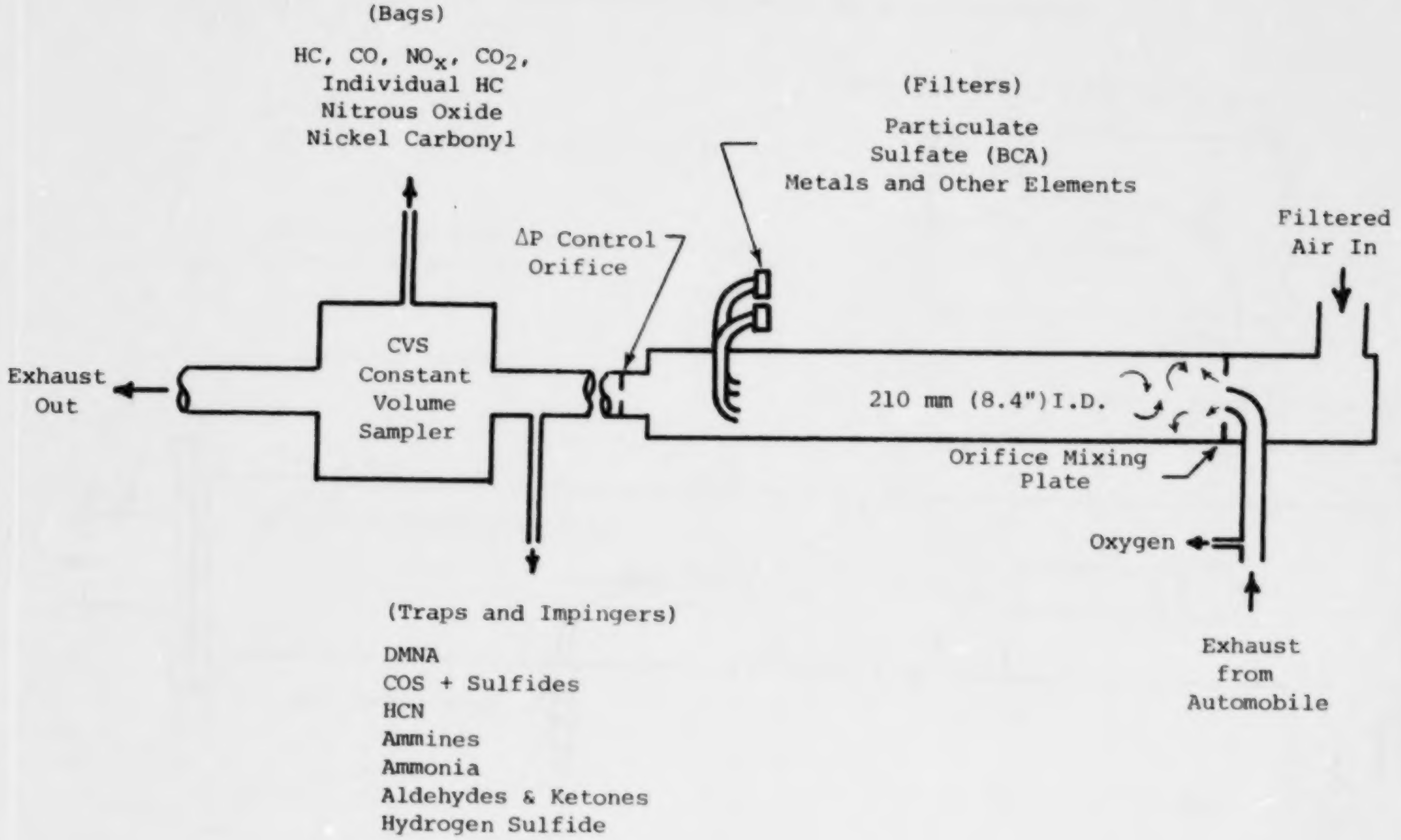

(Bags)
HC, CO, NO$_x$, CO$_2$,
Individual HC
Nitrous Oxide
Nickel Carbonyl
(Filters)
Particulate
Sulfate (BCA)
Metals and Other Elements
Filtered
Air In
ΔP Control
Orifice
Exhaust
Out
CVS
Constant
Volume
Sampler
210 mm (8.4") I.D.
Orifice Mixing
Plate
Oxygen
Exhaust
from
Automobile
(Traps and Impingers)
DMNA
COS + Sulfides
HCN
Ammines
Ammonia
Aldehydes & Ketones
Hydrogen Sulfide

Figure 2. Gasoline engine emissions sampling system.

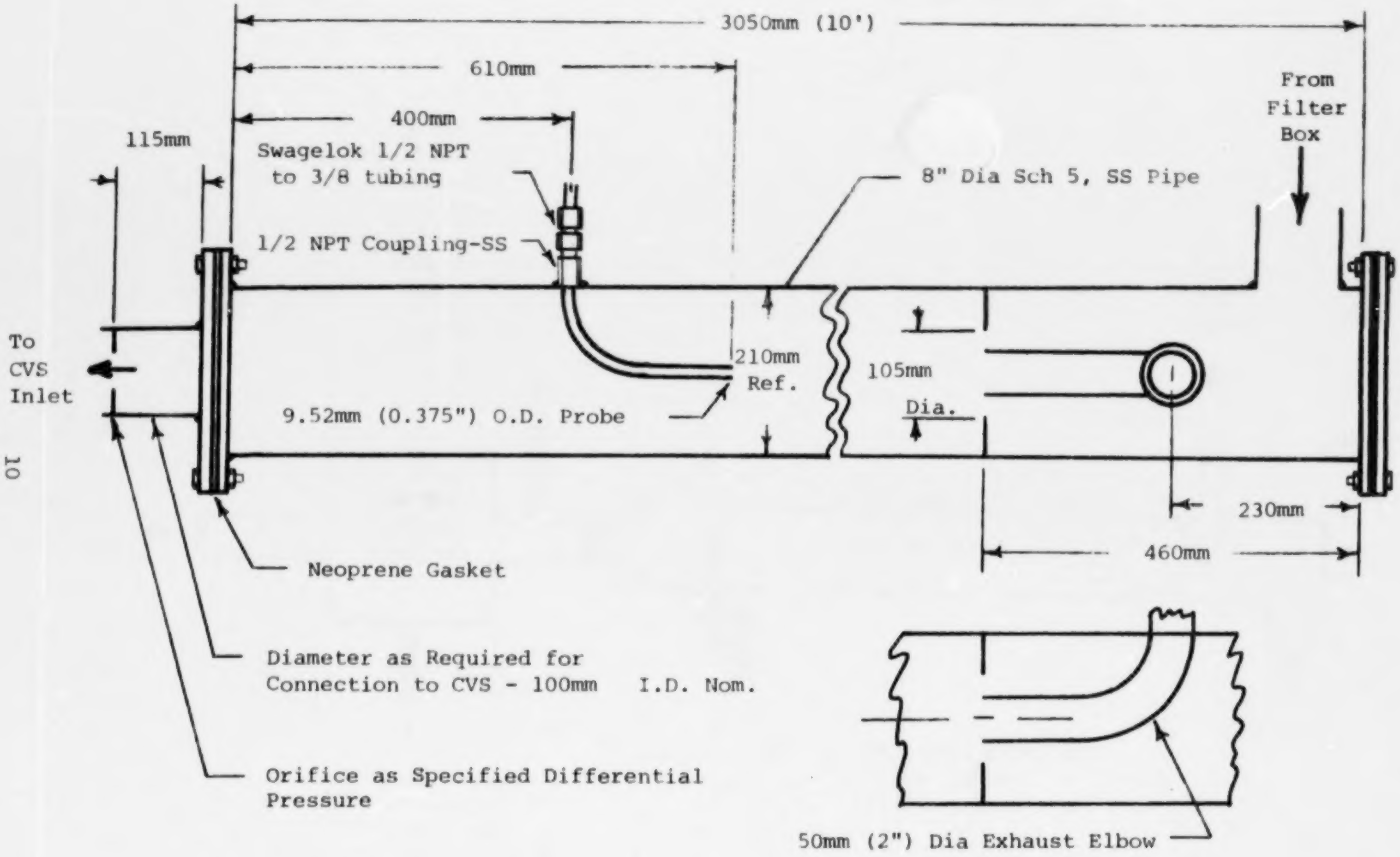
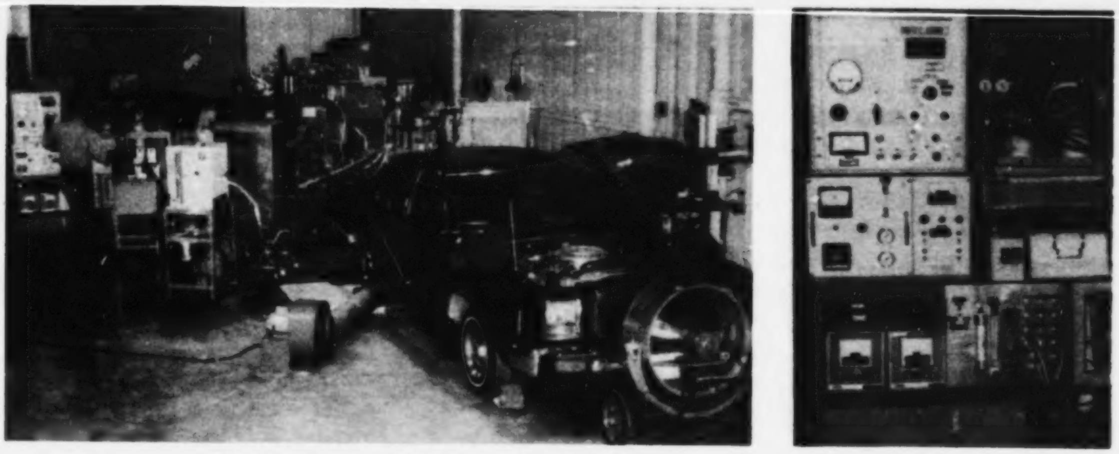
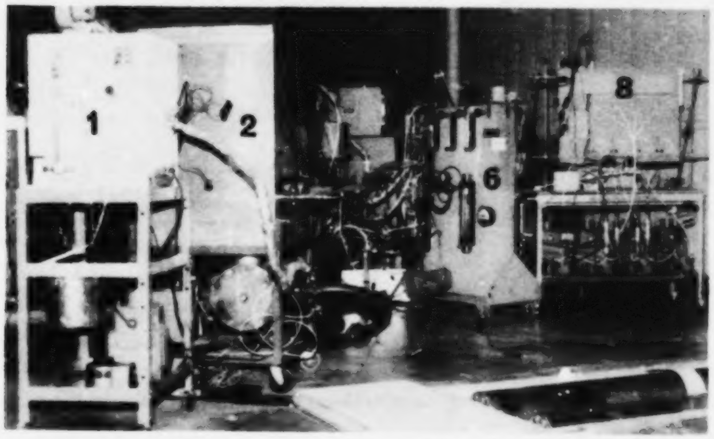

3050mm (10')
610mm
400mm
115mm
From
Filter
Box
Swagelok 1/2 NPT
to 3/8 tubing
1/2 NPT Coupling-SS
8" Dia Sch 5, SS Pipe
To
CVS
Inlet
210mm
Ref.
105mm
Dia.
9.52mm (0.375") O.D. Probe
230mm
460mm
Neoprene Gasket
Diameter as Required for
Connection to CVS - 100mm I.D. Nom.
Orifice as Specified Differential
Pressure
50mm (2") Dia Exhaust Elbow

Figure 3. Dimensional schematic of dilution tunnel.



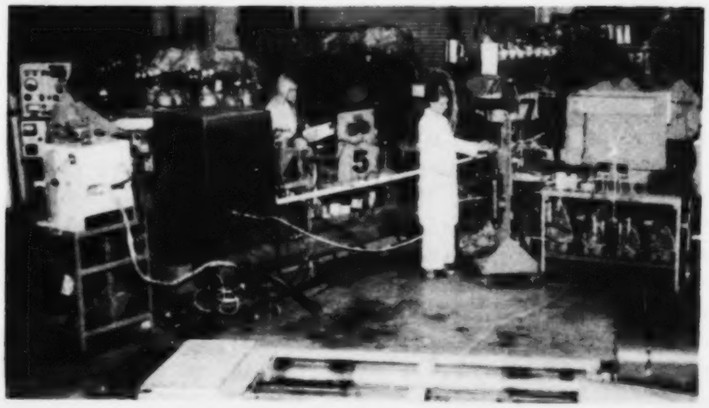
A. Entire Sampling System

B. Regulated Emissions



1. HC Oven
2. CVS Filter Box
3. Dilution Tunnel
4. Particulates
5. Organic Sulfides
6. DMNA
7. Organic Amines, Ammonia, Aldehydes, Hydrogen Sulfide, Cyanides Sample
8. Amines, NH_3, Aldehydes, H_2S, CN^- Background

C. Unregulated Emissions



D. Entire Sampling System

Figure 4. Views of the emissions sampling system

CO_2 using SwRI Bag Cart Number 1. This bag cart was designed, calibrated and operated in accordance with the appropriate sections of the Code of Federal Regulations applicable to light-duty vehicles.(2)

In addition, the levels of dilute HC, CO, NO_x and CO_2 were recorded continuously on a strip chart recorder. These dilute emissions are automatically engine exhaust flow-weighted, and provide a better insight into variability of mass emissions during cyclic procedures than would be provided by continuous direct emission measurement. Other items continuously recorded were the vehicle speed, the oxygen level in the undiluted exhaust and the catalyst exit temperature. The instrumentation used for these continuously recorded data were as follows:

Parameter	Instrument or Method		
Measured	Type	Make & Model	Ranges Used
HC	FID	SwRI No. 007	100 through 3200 ppm
CO	NDIR	Beckman 315B	0.3, 0.6 & 1.5%
NO_x	CL	Thermo Electron 12A	100 & 1000 ppm
CO_2	NDIR	Beckman 315 B	6%
O_2	Polorographic	Beckman 715	5 & 25%
Temp.	Thermocouple		
Speed	Parallel output from the Dynamometer Controls		

These continuously recorded data were used for obtaining the catalyst maximum temperature and in helping to resolve any problems or questions occurring with the other test data. In addition, these data remain available in the event they may be useful in clarifying future findings.

The catalyst average temperature and the average oxygen level in the undiluted exhaust were obtained using Acromag 1324-LY-1 integrators. The average oxygen level was subsequently determined to have minimal meaning for most of these evaluations. Often times, the oxygen level was high when the exhaust flow was low (e.g., idle and cut-throttle) and relatively low when the exhaust flow was relatively high (e.g., highway speed). The integration of the oxygen in the undiluted exhaust does not compensate for these changes in exhaust flow. It is possible to have a significant average oxygen level and yet be deficient in oxygen over some portion of the driving cycle. Therefore, the average oxygen level serves only as a general indicator of the malfunction condition (e.g., average oxygen level decreases somewhat for rich operation). Catalyst temperatures were effected by the placement of the thermocouples and the cooling fans.

F. Emissions Test and Mileage Accumulation Procedures

One Federal Test Procedure, two driving schedules and one mileage accumulation procedure were utilized in this project. These are defined as follows:

FTP - 1977 Federal Test Procedure(2) (uses the Urban Dynamometer Driving Schedule)

SET - Congested Freeway Driving Schedule(3)

HFET - Highway Fuel Economy Driving Schedule(4)

MDDS - Modified Durability Driving Schedule for mileage accumulation(5) (with all WOT Accelerations changed to normal Accelerations). This schedule is described in Appendix A-1.

Each of the three procedures and schedules, requiring emissions testing in this project (FTP, SEP and HFET), utilized bagged samples for evaluation of regulated emissions and fuel consumption.

The SET and the HFET are both hot-start, single-segment driving cycles. The FTP, however, involves cold-start and hot-start, multi-cycle with multi-segment operation. In addition, in this project a four-bag FTP was utilized for most of the unregulated emissions; rather than the three-bag FTP specified in the Federal Test Procedure. Therefore, before proceeding, it is important to clarify the meaning of FTP as used in this project:

FTP - The FTP uses the Urban Dynamometer Driving Schedule (UDDS) which is 1372 seconds in duration. The UDDS, in turn, is divided into two segments; the first having 505 seconds and the second having 867 seconds. The Federal Test Procedure consists of a cold-start 505 and a stabilized 867 followed by a hot-start 505. In this project, the hot 505 was followed by another 867 segment. For the remainder of this discussion, and throughout this report, these cycles will be identified as follows:

	Four Cycle FTP			
	Cold UDDS		Hot UDDS	
Cycle	1	2	3	4
Duration, seconds	505	867	505	867
Regulated Emissions, 3-Bag	X	X	X	
Regulated Emissions, 4-Bag	X	X	X	X
Unregulated Emissions:				
Bag	X	X	X	X
Impinger	——X——		——X——	
Trap (Except DMNA)	——X——		——X——	
Trap DMNA	————X————			

NOTE: X designates a sample taken

A composite value in mass per distance for the three-cycle, three-sample FTP regulated emissions is calculated using the following formula:

$$\frac{\text{MASS}}{\text{DISTANCE}} = \frac{0.43 \times (\text{MASS } 1 + \text{MASS } 2) + 0.57 \times (\text{MASS } 3 + \text{MASS } 2)}{0.43 \times (\text{DIST. } 1 + \text{DIST. } 2) + 0.57 \times (\text{DIST. } 3 + \text{DIST. } 2)}$$

Assuming Distance 3 is equal to Distance 1, this equation can be reduced to:

$$\text{3-FTP M/D} \simeq \frac{0.43 \times (\text{M1} + \text{M2}) + 0.57 \times (\text{M3} + \text{M2})}{\text{D1} + \text{D2}}$$

For the four-cycle FTP, two sample, composite values determined in this project, the following formula was used:

$$\frac{\text{MASS}}{\text{DISTANCE}} = \frac{0.43 \times \text{M}(1 + 2) + 0.57 \times \text{M}(3 + 4)}{0.43 \times (\text{D1} + \text{D2}) + 0.57 \times (\text{D3} + \text{D4})}$$

Assuming Distance 3 is equal to Distance 1 and Distance 4 is equal to Distance 2, then this equation can be reduced to:

$$\text{4-FTP M/D} \simeq \frac{0.43 \times \text{M}(1 + 2) + 0.57 \times \text{M}(3 + 4)}{\text{D1} + \text{D2}}$$

Therefore, with the assumption that the changes in distance traveled are negligible, the composite results with the four-cycle FTP relative to results with the three-cycle FTP will differ only as the mass emissions emitted during Cycle 4 differ from that emitted during Cycle 2. An assumption made, that the overall effect of such differences were relatively minor, was subsequently validated in the Task 1 evaluations.

The test sequence followed for each automobile is given in Table 3. Sequences 1 through 7 were repeated for each of four malfunction conditions on each automobile. The sequence followed in the laboratory for running one set of emissions tests (FTP, SET and HFET) is given in Table 4.

The parameters of the three driving schedules used are summarized in Table 5 and the schedules are illustrated in Figure 5. Other driving cycle designations frequently used for the FTP are LA-4 and UDDS and for the SET are CFDS and SET-7. In general, the FTP involves stop-and-go operation with maximum speed generally below 65 km/hr (40 mph). The HFET generally involves operation between 65 and 95 km/hr (60 mph). The SET appears to incorporate characteristics of both the FTP and the HFET.

G. Test Numbering System

The numbering system, established for the various related unregulated emissions projects being conducted at this laboratory, consists of six digits. One of the digits was not required for this project so a dash (-) was used in its place. The designations used for all vehicle testing, subsequent to the malfunction screening evaluation, was PVM-ST. The meaning of each letter or group of letters is described as follows:

TABLE 3. TEST SEQUENCE FOR EACH MALFUNCTION

Sequence	Operation Performed on Vehicle
upon receipt	Tune-up to manufacturer's specifications
1	Precondition for 1600 km (995 mi) using the MDDS
2	Run FTP, SET, HFET - Sample and analyze applicable Task 2 compounds
3	Precondition for 200 km (125 mi) using the MDDS
4	Modify to operate in a Task 1 malfunction condition
5	Precondition for 100 km (62 mi) using the MDDS
6	Run FTP, SET, HFET: FTP, SET, HFET - Sample and analyze applicable Task 2 compounds
7	Return to unmodified condition, replace the catalyst, and tune-up to manufacturer's specifications.

FTP - Federal Test Procedure

SET - Congested Freeway Driving Schedule

HFET - Highway Fuel Economy Driving Schedule

MDDS - Modified Durability Driving Schedule

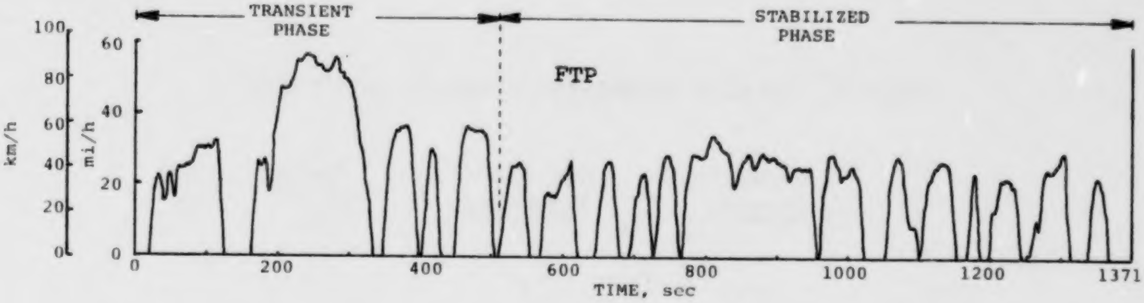
TABLE 4. LABORATORY TEST SEQUENCE

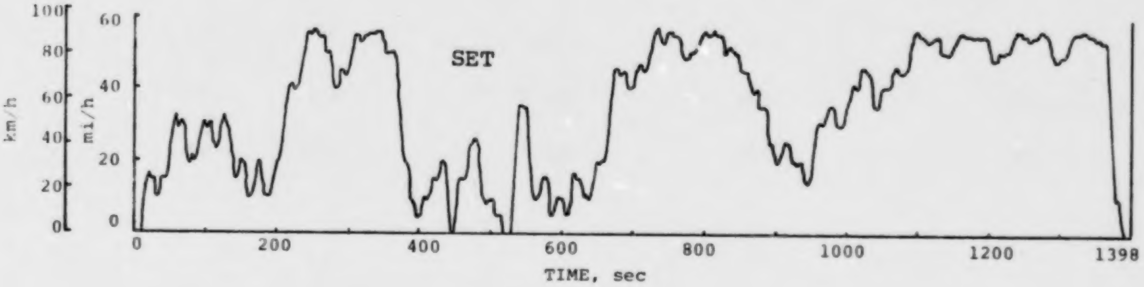
1. Precondition, UDDS
2. Soak 12 to 20 hours
3. FTP - 4 bags for gaseous emissions
   2 filter or impinger samples
4. Soak 20 minutes - Fan Off
5. Precondition first 505 seconds of UDDS
6. Idle 1 minute (± 15 seconds)
   - (a) auto trans - drive
   - (b) start additional cooling blowers
   - (c) place filter holder in tunnel
7. SET - 1 bag sample
   1 filter or impinger sample
8. Engine Off - 10 minutes - Fan Off
9. HFET - 1 bag sample
   1 filter or impinger sample

NOTE: 5000 cfm fan on during all car operation. Additional tire and fuel tank cooling blowers on during all SET and HFET operation

TABLE 5. SUMMARY OF DRIVING SCHEDULE PARAMETERS

	Duration, Seconds	Distance, Kilometers	Average Speed km/hr	Average Speed mph
FTP:				
505	505	5.8	--	--
866	866	6.2	--	--
UDDS	1371	12.0	31.4	19.5
SET	1398	21.7	56.0	34.8
HFET	765	16.5	77.6	48.2





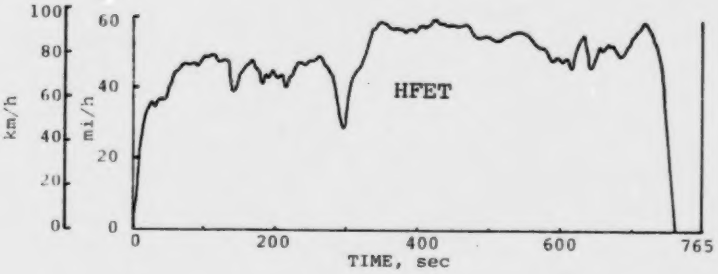


Figure 5. Driving cycle speed vs time traces.

	Description	As used for this project
PV	Vehicle Designation	
	P Project	1
	V Vehicle	1 through 5
M-	Condition Tested	
	M Malfunction	1 through 5
	- Space not used in this project	-
S	Test Series (Unmodified or Malfunction)	1 through 3
T	Individual Test (FTP, SET or HFET)	1 through 3

The PV is used to identify the vehicle tested

In this project, the test condition is sufficiently identified by one digit so the M, followed by a dash (-), is used to identify the specific malfunction conditions

The S designated the test series (FTP, SET, HFET) where:

1 = Unmodified vehicle
2 & 3 = Initial and repeat test in a malfunction configuration

The T designates the individual test conducted where:

1 = FTP
2 = SET
3 = HFET

H. Computational Methods

The methods used for calculating the unregulated emissions results are given in Appendix A-3. All regulated emissions were calculated using the methods prescribed in the code of Federal Regulations for Light-Duty Vehicles.(2) On the computer printouts for the regulated emissions, included in Appendixes B and E, all items of potential interest are identified by descriptive headings. Items on the computer sheet identified only by abbreviated headings are used in calculating the unregulated emissions.

III. ANALYTICAL PROCEDURES FOR UNREGULATED EMISSIONS

The analytical procedures used to measure the unregulated emissions are summarized in this section. A detailed description of the procedures along with a discussion of their development, validation, and qualification is available in Interim Report II, "Analytical Procedures for Characterizing Unregulated Pollutant Emissions From Motor Vehicles," developed in a related EPA project. (1)

A. Description of the Analytical Procedures

The unregulated emissions evaluated in this project, along with the methods for sampling and the procedures used in the analyses, are listed in Table 6. Organic sulfides, organic amines, aldehydes and ketones, individual hydrocarbons, and metals and other elements represent groups of compounds. The respective procedures separate and identify a number of individual compounds within each of these groups. The analytical procedures involved in this project are briefly described as follows:

Organic Amines - The collection of organic amines (monomethylamine, monoethylamine and dimethylamine, trimethylamine, diethylamine, and triethylamine) is accomplished by bubbling CVS diluted exhaust through glass impingers containing dilute sulfuric acid. The amines are complexed by the acid to form stable sulfate salts which remain in solution. A portion of this solution is then injected into a gas chromatograph equipped with an ascarite loaded pre-column and a nitrogen phosphorus detector (NPD). External amine standards in dilute sulfuric acid are used to quantify the results. Some analyses were also conducted using undiluted exhaust.

Ammonia - Ammonia in CVS diluted automotive exhaust is measured in the protonated form, NH_4^+, after collection in dilute H_2SO_4. The acidification is carried out in a glass impinger maintained at ice bath temperature. A sample from the impinger is then analyzed for ammonia in an Ion Chromatograph and the concentration in the exhaust is calculated by comparison to an ammonium sulfate standard solution.

Aldehydes and Ketones - The collection of aldehydes (formaldehyde, acetaldehyde, isobutyraldehyde and hexanaldehyde) and ketones (acetone and methylethylketone) is accomplished by bubbling CVS diluted exhaust through glass impingers containing 2,4-dinitrophenylhydrazine (DNPH) in dilute hydrochloric acid. The aldehdyes and ketones (also known as carbonyl compounds) react with the DNPH to form their respective phenylhydrazone derivatives. These derivatives are insoluble or only slightly soluble in the DNPH/HCl solution and are removed by filtration followed by pentane extractions. The filtered precipitate and the pentane extracts are combined and then the pen-

TABLE 6. SAMPLING AND ANALYSIS METHODOLOGY FOR UNREGULATED EMISSIONS

Compound	Sampling	Method of Analysis
Organic Amines	Impinger	Gas chromatograph with ascarite pre-column and nitrogen-phosphorus detector (GC-NPD).
Ammonia (NH_3)	Impinger	Ion chromatograph.
Aldehydes and Ketones	Impinger	Dinitrophenylhydrazone derivative. Gas chromatograph with flame ionization detector.
Hydrogen Sulfide (H_2S)	Impinger	Methylene blue derivative. Spectrophotometer.
Total Cyanide [Hydrogen Cyanide (HCN) and Cyanogen (C_2N_2)]	Impinger	Cyanogen chloride derivative. Gas chromatograph with electron capture detector (GC-ECD).
Carbonyl Sulfide (COS) and Organic Sulfides	Trap	Gas chromatograph with flame photometric detector (GC-FPD).
Nitrous Oxide (N_2O)	Bag	Gas chromatograph with electron capture detector (GC-ECD).
Nickel Carbonyl ($Ni(CO)_4$)	Bag	Chemiluminescence (CL)
Individual Hydrocarbons	Bag	Gas chromatograph with flame ionization detector.
Metals and Other Elements	Filter	Weighed using microbalance. Spectral X-ray analysis at RTP.
Particulates	Filter	Weighed using microbalance.
Sulfate	Filter	Barium chloranilate derivative (BCA). Liquid chromatograph with ultraviolet detector.
DMNA	Trap	Gas chromatograph with mass spectrometer at RTI (GC-MS).
Boiling Point Distribution	Trap	Gas chromatograph with capillary column and flame ionization detector.

tane is evaporated in a vacuum oven. The remaining dried extract contains the phenylhydrazone derivatives. The extract is dissolved in a quantitative volume of toluene containing a known amount of anthracene as an internal standard. A portion of this dissolved extract is injected into a gas chromatograph and analyzed using a flame ionization detector.

Hydrogen Sulfide - The collection of hydrogen sulfide is accomplished by bubbling CVS diluted exhaust through glass impingers containing a buffered zinc acetate solution which traps the sulfide ion as zinc sulfide. The absorbing solution is then treated with N,N-dimethyl-para-phenylene diamine sulfate and ferric ammonium sulfate. Cyclization occurs, forming the highly colored heterocyclic compound methylene blue (3,9-bisdimethylaminophenazothionium sulfate). The resulting solution is analyzed with a spectrophotometer at 667 nm in a 1-cm or 4-cm pathlength cell depending upon the concentration.

Total Cyanide (Hydrogen Cyanide plus Cyanogen) - The collection of total cyanide is accomplished by bubbling CVS diluted exhaust through glass impingers containing a 1.0 N potassium hydroxide absorbing solution. This solution is maintained at ice bath temperature. An aliquot of the absorbing reagent is then treated with KH_2PO_4 and Chloramine-T. A portion of the resulting cyanogen chloride is injected into a gas chromatograph equipped with an electron capture detector (ECD). External CN^- standards are used to quantify the results.

Carbonyl and Organic Sulfides - The collection of carbonyl sulfide (COS) and the organic sulfides, methyl sulfide (dimethylsulfide, $(CH_3)_2S$), ethyl sulfide (diethylsulfide $(C_2H_5)_2S$) and methyl disulfide (dimethyldisulfide, $(CH_3)_2S_2$), is accomplished by passing CVS diluted exhaust through Tenax GC traps at -76°C. At this temperature the traps remove the organic sulfides from the dilute exhaust. The organic sulfides are thermally desorbed from the traps into a gas chromatograph sampling system and injected into a gas chromatograph equipped with a flame photometric detector for analysis. External organic sulfide standards generated from permeation tubes are used to quantify the results.

Nitrous Oxide - For measurement of nitrous oxide, a sample of the CVS diluted exhaust is collected in a Tedlar bag. This bagged sample is then analyzed for nitrous oxide using a gas chromatograph equipped with an electron capture detector. Calibration blends are used to quantify the results. Gas chromatograph peak areas are obtained using a Hewlett-Packard 3354 computer system.

Nickel Carbonyl - Bagged samples of the CVS diluted exhaust are analyzed for nickel carbonyl ($Ni(CO_4)$ using a chemiluminescent NO_x analyzer modified with a No. 54 wratten filter. Bottled calibration blends are used to quantify the results. The instruments has linear response between 0.1 ppb and 0.1 ppm.

Individual Hydrocarbons - For measurement of selected individual hydrocarbons, methane (CH_4), ethane (C_2H_6), ethylene (C_2H_4) acetylene (C_2H_2), propane (C_3H_8), propylene (C_3H_6), benzene (C_6H_6), and toluene (C_7H_8), a sample of CVS diluted exhaust is collected in a Tedlar bag. This bagged sample is then analyzed for individual hydrocarbons using a gas chromatographic system containing four separate columns and a flame ionization detector. The peak areas are compared to an external calibration blend and the individual hydrocarbon concentrations are obtained using a Hewlett-Packard 3354 computer system.

Metals and Other Elements - The metals are collected as particulate on a 47-mm Fluoropore filter, which is then sent to Research Triangle Park (RTP) for analysis by X-ray spectroscopy. The diluted exhauat sample is taken isokinetically from within the dilution tunnel. Weight gain on the filter is determined by weighing the filter on a microbalance before and after sampling.

Particulates - The "particulate" is collected isokinetically on a 47-mm glass fiber filter. The amount of "particulate" collected in determined by weighing the filter on a microbalance before and after sampling.

Sulfate - Automotive exhaust is vented into a dilution tunnel where it is mixed with a flowing stream of filtered room air. In the tunnel, the SO_3 reacts rapidly with water in the exhaust to form sulfuric acid aerosols. The aerosols grow to a filterable size range within the tunnel and are collected isokinetically on a fluorocarbon membrane filter. Particulate sulfate salts are also collected on the filter.

Sulfuric acid collected on the filter is then converted to ammonium sulfate by exposure to ammonia vapor. The soluble sulfates are leached from the filter with a masured volume of an isopropyl alcohol - water solution (60% IPA). A fixed volume of the sample extract is injected into a high pressure liquid chromatograph (HPLC) and pumped through a column of strong cation exchange resin in Ag^+ form to scrub out the halides (Cl^-, Br^-) and then through a column of strong cation exchange resin in H^+ form to scrub out the cations and convert the sulfate to sulfuric acid. Passage through a reactor column of barium chloranilate crystals precipitates out barium sulfate and releases the highly UV absorbing chloranilate ions. The amount of chloranilate ions released is equivalent to the sulfate in the sample and is measured by a sensitive liquid chromatograph UV detector at 310-313 nanometers. All the reactions and measurement take place in a flowing stream of 60% IPA. The scrubber and reactor columns also function as efficient filter media for any solid reaction products formed during passage of the sample through the column system.

DMNA - The measurement of N-nitrosodimethylamine is accomplished by collecting dilute exhaust (approximately 185:1 total dilution) in Tenax GC sampling cartridges and shipping the cartridges to Research Triangle Institute (RTI) for analysis by capillary gas-liquid chromatography/mass spectrometry. The single ion monitoring (m/e 74) procedure used is not specific to DMNA. Results using this procedure represent a total composite value for all materials having background ions of m/e 74 and the same retention time as DMNA. Since this procedure was not included in Interim Report II(1), a brief description of this procedure is included in Appendix A-2 of this report.

Boiling Point Distribution - Samples for the boiling point distribution are obtained by passing dilute exhaust through traps packed with Chromosorb 102. The traps are eluted with 2 mℓ of carbon disulfide and a portion of the resulting extract is injected into a capillary-Gas Chromatograph system for analysis. A Hewlett-Packard 3354 computer system is used to obtain peak areas and a boiling point distribution. The system as used in this project is qualitative only.

Other Compounds Considered - Initially phosphine and several halogen compounds were to be evaluated in this project, and a literature search was conducted to identify potential analytical methods. The halogen compounds included phosgene, vinyl chloride, bromine, chlorine, hydrobromic acid and hydrochloric acid. The requirement to measure these compounds was deleted along with the deletion of leaded fuel as one of the malfunction conditions to be evaluated in this project. Other compounds which were given some consideration were phenols and BaP.

B. Validation and Qualification of the Analytical Procedures

The analytical procedures used in this project were subjected to a series of validation and qualification experiments. Validation experiments included checks for sample stability, sample collection efficiency, detector linearity, interferences, and analysis repeatability. The qualification experiments included the injection of the compound of interest into the tunnel with and without the presence of exhaust and the subsequent recovery of that compound at the procedure sampling point.

Sample stability checks were performed using repeated analysis of the same sample at intervals over a specified period of time and comparing the results to the initial analysis. Organic amines, aldehdyes and ketones, ammonia, total cyanide, nitrous oxide and individual hydrocarbon samples were found to be stable for several days. Carbonyl and organic sulfides and the hydrogen sulfide samples were found to be stable for approximately one day. Nickel carbonyl is stable for only a few hours.

Sample collection efficiency experiments were performed by passing a known concentration of sample through a series of impingers or traps and analyzing each impinger or trap individually for the compound of interest. All procedures used in this project have a collection efficiency of 98% or better. Detector linearity experiments were performed by preparing several samples of various known concentrations and plotting the resulting peak area versus the concentrations. All the procedures had linear response over the range of interest in this project.

To determine the interferences for each procedure, known exhaust components were introduced into the sample to determine their effect on the resultant measurements. To determine analysis repeatability, several samples of known concentrations were prepared and a number of complete analyses were performed at each concentration. The results of these tests were then compared to determine analyses repeatability.

The qualification experiments were performed to determine if the compounds of interest could travel the length of the dilution tunnel in the presence of dilute exhaust without significant loss by reaction with exhaust or the tunnel itself. The compounds were introduced at the same point at which the exhaust enters the tunnel and were sampled at the normal sampling point. Table 7 lists the procedures for which validation and qualification experiments were performed.

C. Accuracy of the Analytical Procedure

A difficult, but very important, endeavor was the determination of procedural accuracy for each analytical method. The primary difficulty involved those procedures in which the exhaust compounds are trapped or absorbed, an extraction or subsequent reaction is performed, and then a portion of the extraction is analyzed. After much consideration, the decision was reached to initially define the accuracy in terms of a "minimum detection value" (MDV). The MDV, as used in this report, is defined as the value above which it can be said that the compound has been detected in the exhaust (i.e., the accuracy is equal to plus or minus the MDV at a measured value equal to the MDV). Determination of accuracy over the entire range of each procedure was beyond the scope of the project.

For compounds collected by bag samples, the MDV was determined from the instrument detection limits only and is independent of the sampling rate and duration. For compounds which are concentrated in impingers or traps, the MDV is dependent on the instrument detection limit, chemical workup, sampling rate and sampling duration. The MDV's listed in Table 8 were derived using the listed sampling rates and a 23-minute sampling period.

TABLE 7. PROCEDURAL VALIDATION AND QUALIFICATION

Compound or Compound Group	Validation Conducted	Qualification Conducted
Organic Amines	Yes	Yes (significant tunnel losses)
Ammonia	Yes	Yes (significant tunnel losses)
Aldehydes and Ketones	Yes	Yes
Hydrogen Sulfide	Yes	Yes
Total Cyanide	Yes	Yes
Carbonyl Sulfide and Organic Sulfides	Yes	Yes (significant tunnel losses)
Nitrous Oxide	Yes	Yes
Nickel Carbonyl	Yes	No[a]
Individual Hydrocarbons	Yes	No[b]
Metals and Other Elements	No[b]	No[b]
Particulates	No[b]	No[b]
Sulfate	No[b]	No[b]
DMNA	No[c]	No[c]
Boiling Point Distribution	No[d]	No[d]

[a] Compound considered too dangerous to perform qualification experiments.
[b] Established procedure.
[c] Performed at RTP and RTI.
[d] Procedure qualitative only.

TABLE 8. EMISSION PROCEDURAL SAMPLE RATES AND ACCURACY

	Mol. Wt.	Sample Flow ℓ/min	μg/m^3 per ppm	Procedural Minimum Detection Values[a]		MDV for FTP, mg/km[b]
				ppm	μg/m	
Test Number, PVM-ST	--	--	--	--	--	--
Barometer, mm Hg	--	--	--	--	--	--
Humidity, g/kg	--	--	--	--	--	--
Temperature, °C	--	--	--	--	--	--
Total Fuel Sulfur, mg/km	--	--	--	--	--	--
Avg. Exh. Oxygen	32.00	--	--	--	--	--
Catalyst Avg. Temp., °C	--	--	--	--	--	--
Catalyst Max. Temp., °C	--	--	--	--	--	--
Carbon Dioxide, g/km	44.01	Bag	--	--	--	--
Fuel Cons., ℓ/100 km	--	--	--	--	--	--
Regulated Emissions						
Hydrocarbons (THC)	11.88	Bag	575	1.0[c]	575	10
Carbon Monoxide	28.01	Bag	1165	2.0[c]	2330	40
Oxides of Nitrogen	46.01	Bag	1915	0.5[c]	958	16
Particulates						
Total Particulates	--	14.0	--	--	<50	<1
Sulfate	96.01	14.0	4000	<0.01	6	0.1
Compound Group Totals						
Aldehydes & Ketones	--	4.0	--	--	--	≃0.5
Individual Hydrocarbons	--	Bag	--	--	--	≃0.5
Organic Sulfides	--	0.13	--	--	--	≃0.05
Organic Amines	--	4.0	--	--	--	≃0.1
Other Compounds						
Ammonia	17.03	4.0	710	0.01	7	0.1
Cyanide & Cyanogen	26.02	4.0	1080	0.01	11	0.2
DMNA	74.08	5.0	3080	--	--	--
Hydrogen Sulfide	34.08	4.0	1415	0.01	14	0.2
Nickel Carbonyl	107.75	Bag	7100	0.0001	0.7	0.01
Nitrous Oxide	44.02	Bag	1830	0.01	18	0.3

[a] Based on a 23-minute sampling period at the specified flow rate for all impinger, filter and trap collected samples.

[b] Based on μg/m^3 in the diluted exhaust and typical UDDS (FTP 505 & 866) parameters (1371 seconds, 10 D.F., 206 m^3 CVS flow, 12.0 km, 0.98 DSFC) mg/km for FTP ≃ μg/m^3 × 206 ÷ 12.0 × 0.98 × 0.001 ≃ 0.0168 × μg/m^3. For SET: mg/km ≃ 0.55 × mg/km for FTP. For HFET: mg/km ≃ 0.74 × mg/km for FTP.

[c] Based on the instrument ranges generally used in this project.

TABLE 8 (CONT'D). EMISSION PROCEDURAL SAMPLE RATES AND ACCURACY

	Mol. Wt.	CRC[d] Synonym	$\mu g/m^3$ per ppm	Procedural Minimum Detection Values[a] ppm	Procedural Minimum Detection Values[a] $\mu g/m^3$	MDV for FTP, mg/km[b]
Aldehydes and Ketones						
Formaldehyde	30.03	--	1250	0.01	15	0.2
Acetaldehyde	44.05	--	1830	0.01	20	0.3
Acetone[e]	58.08	2-Propanone	2415	0.01	25	0.4
Isobutyraldehyde		--	3000	0.01	30	0.5
Methyl Ethyl Ketone	72.12	2-Butanone	3000	0.01	30	0.5
Crotonaldehyde	70.09	2-Butenal	2915		--	--
Hexanaldehyde	100.16	Hexanal	4165	0.01	40	0.7
Benzaldehyde	106.13	--	4415	--	--	--
Individual Hydrocarbons						
Methane	16.04	--	665	0.05	30	0.5
Ethylene	28.05	Ethene	1165	0.03	30	0.5
Ethane	30.07	--	1250	0.03	30	0.5
Acetylene	26.04	Ethyne	1085	0.03	30	0.5
Propane	44.11	--	1835	0.02	30	0.5
Propylene	42.08	Propene	1750	0.02	30	0.5
Benzene	78.12	--	3245	0.02	30	0.5
Toluene	92.15	--	3830	0.02	30	0.5
Organic Sulfides						
Carbonyl Sulfide	60.08	--	2500	0.001	3	0.04
Methyl Sulfide	62.13	Dimethyl	2585	0.001	3	0.04
Ethyl Sulfide	90.19	Dimethyl	3750	0.001	4	0.06
Methyl Disulfide	94.20	Dimethyl	3915	0.001	4	0.06
Organic Amines						
Monomethylamine	31.06	Amino-Methane	1290	0.002	3	0.05
Monoethylamine[f]	45.09	Amino-Ethane	1875	0.002	4	0.05
Trimethylamine	59.11	--	2460	0.002	5	0.08
Diethylamine	73.14	--	3040	0.002	6	0.10
Triethylamine	101.19	--	4205	0.002	8	0.14

[a & b] See initial page of this table.

[d] Handbook of Chemistry and Physics, 54th Edition.

[e] Includes Acrolein - 56.07 and Propionaldehyde - 58.08 (CRC - Propenal and Propanal respectively).

[f] Includes Dimethylamine - 45.09.

IV. TASK 1 - MALFUNCTION SCREENING EVALUATIONS

Prior to starting the laboratory evaluations on the five cars acquired for this project, a short series of tests were conducted using a rented car. The purposes of these tests were to provide data toward selection of the four malfunction conditions and to verify the applicability of the analytical methods developed for the evaluation of the unregulated emissions. This section discusses the initial selection of malfunction conditions along with the results of the actual laboratory screening evaluations.

A. Selection of Malfunction Conditions

Following an extensive examination of available data on malfunction conditions, by the EPA, seven malfunction conditions were selected as best candidates for this project. The study, however, did not identify the appropriate extent of malfunction. After due consideration, the criteria set was that the extent of malfunction should be as severe as possible while still retaining reasonable driveability and driver acceptability. The candidate malfunctions are discussed separately as follows:

Rich Operation at Idle - An effort was made toward defining a suitable idle mixture setting for use in this project. This involved looking at idle mixture settings experienced in several readily available report and papers and at specified idle mixture settings for 1971 and earlier model vehicles. Unfortunately, no idle related malfunction data on current model automobiles was available for this review.

In a study involving 1000 (1957-1971 model year) light-duty vehicles, the overall average CO emissions rate at idle was 16.2 grams/min.(6) In a study of 368 (1966-1969) cars, the idle CO ranged from near 0 to 10 percent.(7) About half of the cars had idle CO above 3 percent. Of the 368 cars, 37 had idle CO greater than 7.5 percent. In a study of 16 (non-California) gasoline heavy-duty trucks ranging from the 1965-1975 model year, the average exhaust CO emissions was 3.5 percent and the average emissions rate was 30 grams/min.(8) The results with the 16 trucks, with idle operation generally rated as satisfactory, are summarized as follows:

Exhaust Emission at Idle	
Raw CO, %	Frequency of Occurrence
0-1	3
1-2	1
2-3	3
3-4	2
4-5	2
5-6	3
6-7	2
0-7	16

If one assumes the same average CID and idle speed for the 100 light-duty vehicles in Reference 6 as for the 16 heavy-duty vehicles in Reference 8, the average percent CO for the 1000 vehicles comes out to be about 2 percent (16.2 ÷ 30 x 3.5).

In summarizing from several repair and service manuals for older vehicles, the following idle mixture settings appear to be applicable for 1966 through Early 197X Cars (Primary Source was the Chilton's Auto Repair Manual, 1973).

- highest steady manifold vacuum
- highest steady idle speed
- lean best idle
- air/fuel ratios of 14.2, 14.0, 13.5 (1.5, 2.3 and 3.5 percent CO based on SUN Combustion Efficiency Meter)
- 2.0 to 3.0 percent CO for 1969-1971 Opel (Motors Emission Control Manual, copyright 1973)

For Pre-1971 Trucks the specified setting was "rich best idle" (Motor's Truck and Diesel Repair Manual, 24th Edition, copyright 1971). Based on these data, it appears that for pre-1970 light-duty vehicles, a specified idle CO setting of around 2 to 3 percent was quite normal. Whereas, actual idle CO values for vehicles in the field ranged from near 0 up to 10 percent.

It was assumed that a maladjustment of idle mixture would tend toward values normally obtained in pre-1970 model cars and trucks. With such an assumption, pre-catalyst CO emissions associated with a maladjustment would probably range between 3 and 8 percent. The extent of malfunction selected for use in the project was "rich best idle" setting. Rich best idle, as used here, is defined as the richest mixture setting at which the engine will idle smoothly. Some newer cars have internal limits on the richest idle mixture attainable. On those cars, an actual "rich best idle" setting could not be attained.

Rich Operation Due to Improper Air Cleaner Maintenance - In another project at this laboratory, some data had been generated on a 1976 Chevrolet Vega with 14,320 km on the air cleaner. The air cleaner involved was flow-checked on an existing SwRI facility and both the emissions and the flow results are reported in this section. The 1975 Light-Duty Emissions Tests results obtained with this car were as follows:

	1975 Light-Duty Emissions Tests Results	
Air Cleaner	14,320 km	New
HC, g/km	0.47	0.26
CO, g/km	10.53	4.48
CO_2, g/km	241.51	267.43
NO_x, g/km	0.63	0.65
Fuel, ℓ/100 km	11.05	11.73

As shown, the HC and CO emissions with the air cleaner which had been used for 14,320 km (and visually appeared to be significantly restricted) were about twice as high as were emissions obtained with a new filter. Fuel consumption, however, was about 6 percent lower with the used filter than with the new filter. There were no driver-detected differences between operation with either the new or used filter.

Flow data for this used filter, another used filter with unknown usage history, and two new filters are summaried as follows:

Flow, Std. m^3/sec(SCFM)	Filter Restriction, kPa (H_2O)			
	14,320 km	Used?	New	New
0.024(50)	0.22	0.22	0.15	0.14(0.6)
0.028(60)	0.32	0.32	0.20	0.20(0.8)
0.038(80)	0.57	0.57	0.32	0.32(1.3)
0.047(100)	0.87	0.87	0.50	0.52(2.1)
0.057(120)	1.19	1.22	0.70	0.72(2.9)
0.066(140)	1.54	1.62	0.97	0.99(4.0)

As shown, the two used filters had approximately equivalent restriction and the two new filters had approximately equivalent restriction. The average ratio of the used to new filter restriction was about 1.65. Based on these data, along with the minimal information that could be obtained from several air filter manufacturers contacted, the decision was reached to essentially double the pressure drop of a new air filter for the car to be tested.

Leaded Fuel Operation - Use of leaded fuel was initially selected as a candidate malfunction. Its use was subsequently deleted by the EPA Project Officer due to lack of emission measurement methods for halogen compounds at the time malfunction conditions were being selected.

Engine Misfire - An Electronic Ignition Misfire unit was assembled in accordance with schematics obtained from the EPA Project Officer. The system was designed and used by Exxon Research and Engineering Company in a previous EPA contract. With only a few difficulties, the initial unit assembled by SwRI functioned well; reflecting good circuit design by Exxon.

Using a standard oscilloscope and the scope on a Sun 1120 Electronic Ignition Tester, it was determined that this unit functions as follows:

Misfire Setting, percent	Misfire Unit Operation
00.00 to 10.00	Misfires the tenth ignition signals to the extent necessary
10.00	Misfires every tenth ignition signal
10.01 to 19.99	Misfires every tenth ignition signal plus fifth ignition signals to the extent necessary
19.99	Misfires every tenth and essentially every fifth ignition signals (19.99 is the maximum setting)

Accuracy of this unit was determined by actual counts in slow speed operation on a bench set-up and in higher speed operation on a vehicle using sequence comparison.

The accuracy of this system, as determined using the scope of the Sun 1120 tester, is illustrated as follows. On an eight cylinder engine with a misfire setting of 10.00 percent, the misfire sequence was either cylinders 2, 4, 6, 8, 2 or 1, 3, 5, 7, 1. With a misfire setting of 10.10 percent at 1000 rpm with a 2, 4, 6, 8, 2 misfire sequence, number 1, 3, 5 and 7 cylinders each misfired once per minute. The actual percent of misfire for the 10.10 percent setting can be determined as follows:

$$\text{Actual Misfires} = 10.00\% + \frac{1 \times 4}{1000 \times 4} \times 100\% = 10.10\%$$

Within the 0 to 19.99 percent misfire setting capability of this unit, it appears that the worst case situation for any one engine cylinder is one misfire for every five ignition signals. Over any long term vehicle operation, with engine starts and stops, each cylinder should experience about the same number of total misfires.

The Electronic Ignition Misfire units was installed on the department owned automobile and driven by a number of individuals in an effort to determine a reasonable misfire malfunction level. The department automobile is a 1972 Plymouth with a 360 CID V-8 engine. Out of seven individuals, three consistently detected levels of 2 to 3 percent misfire as a condition which caused them some concern. (All of these three are good mechanics, drive V-8 powered automobiles, and do their own mechanic work.) One individual consistently detected levels of about 5 percent. With the remaining three, misfire levels up to 7 percent were required before they became concerned. (Two of these three drive very high mileage, 6-cylinder automobiles.) At 10 and 12 percent misfire, although it was readily detectable, driveability remained reasonably acceptable. At much about 12 percent, driveability became unacceptable. A decision was reached to use misfire settings of 7 and 12 percent in the malfunction screening evaluations.

EGR Failure - The failure mode selected was to make the EGR valve inoperable in a closed position. This represents an extreme malfunction condition which would not be readily detectable in many, but not all, makes of cars. Other extreme EGR malfunction conditions, such as the valve stuck open, generally produce severe effects on idle operation and/or driveability. The EGR failure mode was achieved by disconnecting and plugging the vacuum tubing to the EGR.

Air Pump Failure - Several potential air pump failures include: a disconnected air line, air dump valve stuck in the dump position and a broken or disconnected air pump drive belt. In each case essentially no air is pumped into the exhaust system and the failure would not be readily detectable, or of direct concern, to the driver. For this project, the air pump failure mode was achieved by disconnecting the air hose at the check valve and capping the check valve inlet.

Excessive Lubricant Consumption - In several automobile owner's and maintenance manuals, it was stated or indicated that oil consumption of one quart per 1000 miles is to be considered not-excessive. On the other hand, it seems reasonable to assume that essentially all drives would consider adding a quart of engine lubricant at each gasoline fill-up as being excessive, or at least at the very limit of toleration. Therefore, an oil consumption rate of one quart per every 500 kilometers (300 miles) was selected for use in this project.

Several methods were considered for achieving the desired rate of oil consumption. Mixing the lubricant into the gasoline would have been the simplest method. Such mixing, however, would not be representative of the actual process in which high oil consumption normally occurs in an engine. Removing the intake valve guide seals, reaming out the valve guides, installing the oil rings incorrectly, etc. provide more natural methods for achieving high oil consumption. With these methods, however, extensive trial and error would be required to achieve the desired rate of oil consumption.

An oil consumption system was developed to achieve the simulation of oil consumption through the intake valve guides. This system consisted of multi-channel, low flow-rate peristaltic pumps with separate lines to each engine cylinder utilized. The lubricating oil exists onto the intake valve stem at a constant flow rate (except for minor short-term flow changes that occur following a rapid change in engine manifold pressure). The flow rate was individually set for each test cycle to obtain an average oil consumption rate of 2.0 ± 0.2 millilitres per kilometer (300 ± 30 miles per quart).

System installation required a 1/2-NPT (13 mm threaded) port into the intake manifold for each engine cylinder to be utilized. This generally required removing the intake manifold from the engine. With the intake manifold replaced on the engine, 1/8 inch (3.2 mm) outside diameter stainless steel tubing assemblies with compression fittings, were fitted and installed into each threaded port. A U-shaped guide welded onto the end of each tube assured proper horizontal alignment with the intake valve stems. After assuring proper location and contact between the ends of the tubes and the intake valve stems, the tubes were locked into position by tightening the compression fittings.

Once installed, the system could provide a wide range of oil consumption flow rates to the engine. Other than the fact that the installation of this system was rather tedious, no significant difficulties were experienced with the three cars tested using this system. Due to the use of a rented car and scheduling requirements, high oil consumption was not included in the initial malfunction screening evaluations.

Other Malfunction Conditions - Among the conditions initially considered, which were not included as one of the seven candidate malfunctions, were such conditions as a stuck PCV valve, the choke stuck partially closed, and lean operation of the carburetor. Lean operation appears to be a rather limited malfunction condition and, in any severe case, would generally have a significant detrimental effect on driveability. A PVC valve stuck open would have a significant effect at idle and would probably be readily noticeable and of concern to the driver. A partially closed choke or a PVC valve stuck in the minimum flow position or partially plugged would enrich the intake fuel-air mixture. Rich operation was already being evaluated by other methods.

B. Test Plan, Car and Parameters for Task 1 Evaluations

The test plan for the malfunction screening evaluations is given in Table 9. A cold start four-bag FTP was run at each engine configuration. When the change in configuration was minor, one time through the UDDS was used to prepare the car for the test on the following day. Between major changes in configuration, the car was run for several miles over the road before running the preparatory UDDS.

The car used for these screening evaluations was a 1978 Oldsmobile Cutlass with a 305-V8 engine. This car is described as follows:

Source:	Budget Rent-a-Car No. 48013
Make & Model:	1978 Oldsmobile Cutlass Coupe
Engine:	305-V8 w/4-barrel carburetor
Transmission:	Automatic 3-speed
Tires:	Goodyear Polysteel Radial P195/75R14
Accessories:	Power Steering, Power Brakes & Air Conditioning
Serial No.:	3R47H8R405301
Engine No.:	DS305CUIN 810LA 8BFV
Engine Serial:	T0916DAC

Dynamometer power and inertia settings utilized were 8.0 kW (10.7 hp) and 1590 kg (3500 pounds) respectively. An available commercial unleaded gasoline, that does not contain manganese, was used in these screening evaluations. This gasoline, identified as EM-268, has a research octane number of 91.3, a motor octane number of 85.3 and a sulfur level of 0.03 weight percent.

C. Task 1 Results

Initially two baseline runs, involving regulated emissions only, were made. During these evaluations, the unregulated exhaust constituents were also sampled to determine and rectify any difficulties in the sampling system and methods. The computer printouts for these and all malfunction screening evaluations are included in Appendix B. The results of the two baseline runs are summarized as follows:

	Test 10A0			
	Run 1		Run 2	
	3-Bag	(4-Bag)	3-Bag	(4-Bag)
Carbon Dioxide, g/km	345.4	(340.6)	355.2	(350.2)
Fuel Cons., ℓ/100km	15.04	(14.81)	15.50	(15.27)
Hydrocarbons, g/km	0.31	(0.29)	0.40	(0.40)
Carbon Monoxide, g/km	3.78	(3.57)	4.27	(4.06)
Oxides of Nitrogen, g/km	0.83	(0.84)	0.80	(0.81)

TABLE 9. TASK PLAN FOR MALFUNCTION SCREENING EVALUATIONS

A. Use mid-size GM vehicle with 305-V8 engine.
B. Tune-up to manufacturer's specification.
C. Run 4-bag FTP and sample regulated and unregulated emissions for the following configurations.

Test No.	Run No.	Engine Configuration
10A0	1 & 2	Baseline Engine (Regulated Emissions Only)
10A1	1, 2 & 3	Baseline Engine
10B1	1	Rich Best Idle
10A0	3	Baseline Engine (Regulated Emissions Only)
10C1	1	Plugged EGR Vacuum Line
10D1	1	5 Degree Timing Retard (i.e., 1° ATDC)
10D2	1	8 Degree Timing Advance[a] (i.e., 12" BTDC)
10E1	1	Air Flow Restriction (250 mm restriction at 200 cfm)
10F1	1	7 Pct. Ignition Misfire
10F2	1	12 Pct. Ignition Misfire
10A0	4	Baseline Engine (Regulated Emissions Only)

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[a] Point at which pre-ignition just became apparent under rapid acceleration.

The primary purposes of these initial evaluations were to assure that this car produced realistic emission levels and to check out the unregulated emissions sampling systems and methods. These regulated emissions values were below the 1978 limits and appeared to be realistic. The fuel consumption (15.27 ℓ/100 km) was about 17 percent greater than the City value (13.07 ℓ/100 km) given in the 1978 Gas Mileage Guide. Based on the information in the published literature and on the fuel consumption obtained using an equivalent automobile in a recent proprietary project, this rate of fuel consumption appeared to be somewhat on the high side; but did not appear to be unrealistic. Therefore, this automobile was considered to be acceptable for use in these Task 1 malfunction screening evaluations.

These initial baseline evaluations were followed by the series of evaluations involving analyses of unregulated emissions. The results for these evaluations are summarized in Table 10. A repeat of this summary, the computer printouts for regulated emissions and the individual sample FTP results are given in Appendix B. The individual 4-bag results, given in ppm in Appenidx B, are an approximation of the net emissions (exhaust minus background.

The definition for the engine configuration as used in Task 1 are as follows:

Baseline - Car as received with the engine tuned-up to manufacturer's specifications.

Rich Best Idle - Richest mixture attainable due to an internal limit within the carburetor.

No EGR - Vacuum line to EGR was disconnected and plugged.

Ignition Timing - One degree ATDC for 5° Ret and 12 degrees BTDC for 8° Adv.

Dirty Air Filter - Restricted to 2.7 kPa (10.7" of water) at 0.094 standard m^3/sec (200 scfm). Pressure drop for a new filter was 1.5 kPa (5.6" of water).

Misfire - Ignition misfiring at seven percent and at 12 percent.

Referring to the data in Table 10, rich best idle produced the highest emissions values for:

- Hydrocarbons and Carbon Monoxide
- Total Particulates
- Total Individual Hydrocarbons
- Ammonia
- Cyanide and Cyanogen
- Hydrogen Sulfide
- Acetaldehyde

TABLE 10. SUMMARY OF THE TASK 1 COMPOSITE FTP RESULTS
In mg/km, Except as Noted

		Baseline			Rich Best Idle	No EGR	Ignition Timing		Dirty Air Filter	Misfire	
							5° Ret	8° Adv		7%	12%
Test Number,	PVMT-R	10A1-1	10A1-2	10A1-3	10B1	10C1	10D1	10D2	10E1	10F1	10F2
Barometer,	mm, Hg	741.7	735.1	742.4	735.6	740.9	743.5	739.1	731.8	734.1	735.6
Humidity,	g/kg	10.4	12.2	8.8	11.2	8.0	9.7	11.6	12.0	7.5	9.4
Temperature,	°C	25.6	23.3	24.4	23.9	23.3	23.9	22.8	23.9	21.7	23.3
Total Fuel Sulfur,	mg/km	33.81	33.47	33.14	34.39	29.55	34.24	30.91	31.79	32.85	34.02
Avg. Exh. Oxygen,	%	--	--	6.55	3.60	5.15	4.20	4.25	4.05	3.75	3.80
Catalyst Avg. Temp.,	°C	--	--	--	--	--	401	374	390	433	469
Catalyst Max. Temp.,	°C	--	--	423	418	423	474	448	466	524	572
Carbon Dioxide,	g/km	352.2	347.8	346.1	304.4	308.0	355.5	322.4	330.1	337.4	345.6
Fuel Cons.,	ℓ/100 km	15.35	15.20	15.05	15.62	13.42	15.55	14.04	14.43	14.92	15.45
Regulated Emissions											
Hydrocarbons	g/km	0.33	0.31	0.29	2.09	0.32	0.29	0.32	0.35	1.31	2.01
Carbon Monoxide	g/km	4.12	4.72	3.56	34.95	3.41	5.02	3.52	4.42	5.04	6.38
Oxides of Nitrogen	g/km	0.82	0.80	0.75	0.59	2.20	0.62	1.08	0.68	0.79	0.92
Particulates											
Total Particulates		15.89	15.83	7.14	22.55	9.96	7.15	7.35	5.04	6.76	7.26
Sulfate		0.21	0.17	0.11	0.25	0.10	0.19	0.16	0.10	0.18	0.33
Sulfate as % of TFS,	%	0.61	0.51	0.32	0.72	0.34	0.55	0.52	0.30	0.55	0.97
Compound Group Totals											
Aldehydes and Ketones		13.8	1.7	--	10.9	6.5	4.9	2.2	--	9.9	18.4
Individual Hydrocarbons		124.3	148.6	138.5	1141.9	144.0	150.2	139.3	155.1	240.0	228.8
Organic Sulfides		0.14	0.07	0.00	--	--	--	0.25	0.46	0.25	0.11
Organic Amines		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Other Compounds											
Ammonia		2.10	1.32	--	9.25	0.62	0.74	0.72	2.97	1.32	5.05
Cyanide and Cyanogen		0.24	0.58	--	2.27	0.98	0.43	0.65	0.80	0.31	0.34
DMNA		--	--	--	--	--	--	--	--	--	--
Hydrogen Sulfide		0.00	0.00	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00
Nickel Carbonyl		--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrous Oxide		--	12.81	9.67	24.66	29.35	8.29	12.39	9.40	10.58	11.57

TABLE 10 (CONT'D). SUMMARY OF THE TASK 1 COMPOSITE FTP RESULTS
In mg/km, Except as Noted

	Baseline			Rich Best Idle	No EGR	Ignition Timing		Dirty Air Filter	Misfire	
						5° Ret	8° Adv		7%	12%
Test Number, PVMT-R	10A1-1	10A1-2	10A1-3	10B1	10C1	10D1	10D2	10E1	10F1	10F2
Aldehydes and Ketones										
Formaldehyde	3.26	1.41	--	4.62	6.01	1.76	1.20	--	3.11	3.52
Acetaldehyde	1.65	0.00	--	5.43	0.00	0.00	0.64	--	3.16	3.40
Acetone	6.00	0.00	--	0.00	0.00	0.00	0.00	--	2.69	4.40
Isobutyraldehyde	1.88	0.05	--	0.78	0.00	2.99	0.10	--	0.21	0.00
Methyl Ethyl Ketone	0.71	0.00	--	0.05	0.00	0.09	0.12	--	0.54	7.02
Crotonaldehyde	--	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.28	0.19	--	0.06	0.46	0.09	0.15	--	0.14	0.06
Benzaldehyde	--	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	13.8	1.7	--	10.9	6.5	4.9	2.2	--	9.9	18.4
Total as % of THC, %	4.2	0.5	--	0.5	2.0	1.7	0.7	--	0.8	0.9
Individual Hydrocarbons										
Methane	39.88	54.02	50.08	326.2	46.29	61.24	55.99	59.64	58.24	41.70
Ethylene	25.46	29.71	25.66	388.5	21.90	27.25	24.41	28.35	29.93	33.81
Ethane	11.88	16.67	16.49	43.73	11.29	12.02	14.70	13.67	12.53	11.40
Acetylene	5.01	5.98	5.50	8.41	6.40	6.27	5.98	5.13	8.72	2.73
Propane	1.45	1.99	1.56	2.97	0.36	1.40	0.46	1.12	0.76	1.29
Propylene	11.88	13.96	12.56	104.32	11.04	11.85	11.28	14.26	17.72	22.00
Benzene	8.96	12.10	9.41	102.61	13.23	12.05	10.43	12.27	26.71	33.08
Toluene	19.77	14.13	17.24	165.13	33.47	18.10	16.00	20.61	85.37	82.77
Total Individual HC	124.3	148.6	138.5	1141.9	144.0	150.2	139.3	155.1	240.0	228.8
Total as % of THC, %	37.6	47.9	47.8	54.6	45.0	51.8	43.5	44.3	18.3	11.4
Organic Sulfides										
Carbonyl Sulfide	0.14	0.07	0.00	--	--	--	0.00	0.46	0.11	0.07
Methyl Sulfide	0.00	0.00	0.00	--	--	--	0.00	0.00	0.00	0.00
Ethyl Sulfide	0.00	0.00	0.00	--	--	--	0.14	0.00	0.14	0.04
Methyl Disulfide	0.00	0.00	0.00	--	--	--	0.11	0.00	0.00	0.00
Organic Amines										
Monomethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Monoethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Trace
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 10 (CONT'D). SUMMARY OF THE TASK 1 COMPOSITE FTP RESULTS
In mg/km, Except as Noted

		Baseline			Rich Best Idle	No EGR	Ignition Timing		Air Filter	Misfire	
							5° Ret	8° Adv		7%	12%
Test Number, PVMT-R		10A1-1	10A1-2	10A1-3	10B1	10C1	10D1	10D2	10E1	10F1	10F2
Other Elements											
Chromium	Cr					No Data for this test					
Lead	Pb										
Manganese	Mn	0.05	0.05	0.05			0.05	0.09		0.02	0.03
Arsenic	As										
Mercury	Hg										
Bromine	Br										
Phosphorus	P	0.01	0.01		0.01			0.01			
Silicon	Si										
Cadmium	Cd										
Aluminum	Al	0.01	0.01	0.01			0.03	0.02		0.02	0.04
Sulfur	S	0.05	0.04	0.04	0.02		0.04	0.03	0.01	0.04	0.06
Sodium	Na										
Fluorine	F										
Magnesium	Mg	0.01									
Potassium	K										
Chlorine	Cl										0.02
Platinum	Pt										
Zinc	Zn							0.04			
Copper	Cu							0.05			
Nickel	Ni										
Iron	Fe	0.20		0.03			0.14	0.20	0.02	0.29	0.37
Vanadium	V										
Titanium	Ti										
Barium	Ba										
Calcium	Ca										

In addition, rich best idle produced among the highest values of formaldehyde, nitrous oxide and sulfate. No nickel carbonyl was detected under any of the conditions tested. The levels of organic sulfides detected were relatively small, but were above the minimum detection limits of the procedure. Due to procedural difficulties, the organic sulfides during rich best idle were not determined.

In these evaluations, rich best idle generally produced the highest levels for most of the unregulated emissions. It does not appear appropriate to attempt general ranking of the remaining malfunctions without having weighting factors to equalize all emissions to an equivalent level of importance.

D. Analyses of the Task 1 Data

Several analyses of the Task 1 data are discussed in this section. Relationship of Four-Cycle to Three-Cycle FTP - In the Task 1 results for some regulated emissions and some bagged unregulated emissions, there were differences between the emission rates during Cycles 2 and 4. The effect of these differences, however, on the composite results were generally not very significant. The composite three-bag and four-bag results for the baseline evaluations are summarized as follows:

	Seven Baseline Runs				
	Average			Std. Deviation	
	3-Bag	4-Bag	4÷3, %	3-Bag	4-Bag
Carbon Dioxide, g/km	346.8	341.1	98	5.7	7.5
Hydrocarbons, g/km	0.33	0.32	97	0.04	0.04
Carbon Monoxide, g/km	4.31	4.11	95	0.59	0.57
Oxides of Nitrogen, g/km	0.78	0.79	101	0.06	0.07

The overall average and maximum change in the HC, CO, NO_x and CO_2 four-bag results, relative to three-bag results were as follows:

	As Percent of 3-Bag Results	
	Average[a]	Largest Difference
CO_2	98	97
HC	98	91[b]
CO	96	92[b]
NO_x	101	103[c]

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[a] Average of 14 data points

[b] Occurred during rich best idle malfunction condition

[c] Excluding one value of 106 which was not consistent with other values

Referring to these data, it appears that four-bag results produced somewhat lower CO_2, HC and CO and slightly higher NO_x. These differences, however, are judged as being small enough to be considered as negligible for purposes of this project. Therefore, assuming this relationship also applies to all the unregulated emissions, the four-cycle results obtained should be representative of three-cycle results.

Significant Emissions Values - The number of decimal places in the reporting format for unregulated emissions was set at two decimal places after determination of a few procedural "minimum" detection values. In reviewing the Task 1 results, several other areas were also investigated in an attempt toward establishing the appropriate number of significant digits for reporting these data. Two of the other areas were: comparison of the emissions levels to the background levels and relative comparison to the OSHA threshold limit values.

The miminim, maximum and average background levels for several of the unregulated emissions were as follows for the Task 1 evaluations:

	Background Level				
	$\mu g/m^3$		Average		
	Min.	Max.	$\mu g/m^3$	ppm	mg/km[a]
Organic Sulfides	0	0	0	0	0.00
Organic Amines	0	0	0	0	0.00
Ammonia	14	89	44	0.062	0.07
Cyanide and Cyanogen	4	10	6	0.005	0.01
Hydrogen Sulfide	0	<1	0	0	0
Nickel Carbonyl	0	0	0	0	0
Nitrous Oxide	604	714	655	0.358	1.1
Formaldehyde	9	48	22	0.018	0.04
Benzene	16	200	71	0.022	0.11

---

[a] Equivalent values assuming the measured emission levels in the undiluted exhaust were two times the background emission levels. (e.g., nitrous oxide in the undiluted exhaust equal to 0.716 ppm)

To enable determination of an increase in undiluted exhaust level equal to the background level, reporting to two decimal places would be required for several of the compounds shown in the illustration.

Another cursory evaluation involved threshold limit values as recommemded by the 1968 American Conference of Government Hygenists(9) and as reported in the 1976 edition of the "Registry of Toxic Effect of Chemical Substances."(10) These values are defined as the "Concentration in air to which nearly all workers may be continuously exposed without adverse effects." The values for several of the compounds were as follows:

Compound	Threshold Limit Values ppm AC-GH(9)	 RTECS(10)
Ammonia	50	50
Carbon Monoxide	50	50
Benzene	--	10
Cyanide and Cyanogen	10	CN-Skin 5
Hydrogen Sulfide	10	20 ceiling
Amines	--	10[a]
Carbonyl Sulfide	10	--
Nitrogen Dioxide	5	5
Formaldehyde	--	3
Nickel Carbonyl	0.001	0.001

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[a] Lowest value for any of the amines listed

Therefore, on the basis of toxicity many of the compounds appear to range between nitrogen dioxide and carbon monoxide. Oxides of nitrogen and carbon monoxide are normally reported to the nearest one hundredth of a gram per kilometer (i.e., ten milligrams). On this basis, it appears that for some of the unregulated emissions, measuring and reporting to the nearest one hundredth of a milligram may be more accurate than necessary.

Additional procedural "minimum detection values" were determined and from these it appeared that the values ranged from a low of 0.01 for nickel carbonyl up to about 0.5 for aldehydes and individual hydrocarbons. These "minimum detection values", however, were preliminary for several of the substances and subject to change as additional data were developed.

Taking the foregoing factors into account, it was decided best to report the data to a number of decimal places equal to or, in a couple of instances, up to one decimal place more than in the respective "minimum detection values". This method retains the data and eliminates the need for repeated use of terms such as "below preliminary MDV" or "trace" in the tables. It was felt to be important to retain the data until such time that procedural repeatability and reproducibility have been definitely established. Therefore, all data values which are nearly equal to the minimum detection value, whether somewhat above or below, should be used with caution.

V. VEHICLE TESTING

Regulated and unregulated emissions from five late model cars were measured while operating under malfunction conditions. This section presents the results of those evaluations.

A. Test Matrix

The cars, malfunction conditions and procedures are described in previous Sections II through IV. The test matrix for the cars and malfunctions is given in Table 11. Each of the five cars was tested in the rich best idle, 12 percent ignition misfire and disabled EGR malfunction configurations. Three were tested under conditions of excessive oil consumption and two at rich best idle with the air pump disabled.

Due to under-hood component interferences, additional oil could only be supplied to six intake valve stems on Car Test 124, the 1978 Malibu, and to four on Car Test 154, the 1978 Mustang II. On each of the three cars tested, however, the oil consumption rate was maintained at a relatively constant total flow rate of 2.0 ± 0.2 millilitres per kilometer.

B. Test Results

Summaries of the test results are included in Appendix C. Individual sample data for the FTP evaluations are included in Appendix D and the computer printouts for the regulated emissions are included in Appendix E.

In the data tables, a double dash (--) has been used when no test data were available. This occurs for those unregulated emissions which were only tested on a spot-check basis and when valid test data could not be obtained due to instrument malfunction or loss of the sample.

In a number of cases the difficulty encountered with an unregulated emission data point could be satisfactorily corrected. Such corrected data are reported to the nearest whole number. This situation was most prevalent with the individual hydrocarbon and nitrous oxide data due to a sampling system malfunction that remained undetected for some period of time.

All FTP unregulated emissions data, with the exception of DMNA[a], are based on appropriately weighted four-cycle FTP results. The DMNA evaluations consisted of a single trap taken continuously over the first three cycles of

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[a] In this report, the term DMNA represents the total concentration of all materials measured from a mass spectrometric signal at m/e 74.

TABLE 11. SUMMARY OF MALFUNCTION CONDITIONS TESTED

Car	Description	Car Test Number Rich Best Idle	12% Ignition Misfire	Disabled EGR	Excess Oil Cons.[c]	R.B.I. & Disabled Air Pump[d]
11	AMC Pacer	111	112	113	114	--
12	Malibu 49S	121[a]	122	123	124	--
13	Malibu Calif.	131[a]	132	133	--	135
14	Granada	141	142	143[b]	--	145
15	Mustang II	151	152	153	154	--

---

[a] Cars 12 and 13 were set at the maximum rich setting attainable due to an internal limit on the richest mixture attainable. This limit was on the lean side of "rich best idle".

[b] Vacuum hose to the air pump was also disconnected in addition to the vacuum hose to the EGR.

[c] Rate set at 2 mℓ/km (300 miles per quart).

[d] Rich best idle plus complete disabling of the air pump.

the four-cycle FTP. If most of the DMNA were formed during the cold-start 505, then the reported DMNA data would be on the high side (up to a maximum of about 1.5 times the value that would be obtained in a standard weighted three-sample FTP). If the DMNA were produced at a constant rate in all three cycles, then such weighted composite results would be essentially identical to these continuous sample three-cycle results.

C. Other Test Analyses and Evaluations

Additional analyses were conducted at the 12 percent misfire condition and to determine the regulated emissions during operation at idle. Additional evaluations involved sample collection on Teflon-coated glass fiber filters.

Ignition Misfire - A check of the misfire generator was conducted using the data obtained with Car Test 112. Car 11, the AMC Pacer, did not have a catalyst. The results of these evaluations were as follows:

	Fuel Consumption (FC) at 12% Misfire		Emissions Increase(EI), g/km 12% Misfire Minus Unmodified			
Cycle	ℓ/100 km	g/km[a]	HC	CO	HC + 0.5 x CO[b]	EI/FC,[c] Percent
FTP	15.6	115	10.06	2.87	11.5	10.0
SET	13.1	97	7.74	4.59	10.0	10.3
HFET	12.1	89	7.22	5.37	9.9	11.1

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[a] density = 0.739 g/mℓ

[b] CO as fuel = (12/28) x (13.89/12) x CO = 0.5 x CO

[c] EI/FC = total equivalent unburned fuel increase in the exhaust divided by the total fuel consumption on a weight basis.

The preceding illustration does not take into account any of the fuel from misfire which could have oxidized to CO_2. The resultant ratios, of increase in equivalent unburned fuel in the exhaust to total fuel used, agree well enough to assume the car was misfiring at or near the 12 percent misfire setting.

It was noted that the increases in fuel consumption with Cars 122 and 152 were not as great for the SET and HFET as had been experienced for Car 112. For these cars with a catalyst, an analyses of misfire cannot be based on the after-catalyst emission rates. The after-catalyst temperature was increased by the operation under misfire, but there was no method available to calculate an accurate theoretical percent misfire from the increase in catalyst temperature. Therefore, several evaluations were subsequently conducted in conjuntion with Car Test 132.

The initial evaluation with Car 132 was determination of the effect of misfire on steady-state operation. The results were as follows with the throttle held steady at two different initial vehicle speeds.

Speed, km/h (mph)	Percent Misfire	Dynamometer kW (hp)
35 (22)	0	1.1 (1.5)
37 (23)	12	1.2 (1.6)
35 (22)	0	1.1 (1.5)
37 (23)	12	1.2 (1.6)
61 (38)	0	3.0 (4.0)
63 (39)	12	3.1 (4.2)
61 (38)	0	3.0 (4.0)

At these conditions investigated, the speed of the vehicle increased when the engine was misfired at the 12 percent rate.

The next evaluation involved a check of the ignition misfire unit at a vehicle speed of approximately 64 kilometers per hour. Using the Sun 1120 Analyzer, and the procedure utilized in initially calibrating the misfire unit, a setting of ten percent produced a ten percent misfire rate. A setting of twelve percent produced 20 percent more misfires than a ten percent setting.

The final evaluation involved an analysis of the exhaust emission rates before the catalyst. A probe was installed into the exhaust crossover pipe. Results of these evaluations were as follows:

	Emission Rate at Misfire Percent				
Operating Conditions	HC, ppm 0%	HC, ppm 12%	CO_2, % 0%	CO_2, % 12%	% Decrease in CO_2
Idle	3500	10500	9.2	8.3	9.7
20 mph	600	9600	10.9	9.9	9.2
40 mph	900	10900	11.4	10.0	12.3

Based on the large increase in HC and the 9 to 12 percent decrease in CO_2, it can be concluded that misfire on the order of the 12 percent setting was actually occurring.

Therefore, it was concluded that the ignition misfire unit was misfiring the engine at the rate set into the unit. Under some operating conditions, the power output of some of the engines apparently increased as the engine was made to misfire. Fuel consumption over a cycle does not necessarily increase in proportion to the percent of misfire (in some cases it did not increase at all). The catalyst oxidizes most of the raw fuel introduced into the exhaust during operation with ignition misfire.

Disabled EGR - With the AMC Pacer and the two Chevrolet Malibus, disabling the EGR valve had no readily noticeable effect on driveability and performance. With the Ford Granada and Mustang II, however, disabling the EGR valve resulted in signigicant "engine detonation" during part-throttle acceleration. It was sufficiently severe to be of concern to many or most drivers.

Idle Emission Values - Idle emissions values were determined from the dilute emissions values recorded continuously during the evaluations. It should be emphasized, however, that the emissions values during the various idles in a test were found to vary significantly. Therefore, the idle emissions values given in Table 12 represent relative, rather than absolute, values. The dilute values given in the table are the emissions as-read during seconds 153 and 163 in the hot-start UDDS of the FTP. These values were then processed through the computer to determine the dilution ratio. This dilution ratio was then utilized in calculating the approximate raw emission values. Oxides of nitrogen emissions were not included since the low values obtained during idle cannot be accurately determined from the continuous charts.

Pallflex Filter Samples - Upon completion of the testing, a total of five 20-cm by 25-cm (8" x 10") Type T60A20 Pallflex filter samples of the diluted exhaust were taken for possible bioassay analyses at the EPA. The Pallflex filter samples were taken using a high-volume sampling system with a nominal sample flow rate of 0.85 standard m^3/min (30 scfm). The 8.9-cm (3.5 inch) inside diameter sampling probe required the use of an 18-inch diameter dilution tunnel. Available CVS flow rates for use in these evaluations were 9 and 14 standard m^3/min (300 and 500 scfm). In order to keep the sample temperature at the Pallflex filter below 43°C (100°F), use of the 14-m^3/min CVS was required with Car Tests 113 and 142.

The same filter was used throughout a four-bag FTP. After weighing each filter, following sampling, the filters were sealed in a bag and stored in a freezer at minus 18 degrees centrigrade (0°F).

The results were as follows for the four-bag FTP evaluations sampled:

Car			Pallflex Filter		Total mg
No.	Description	Malfunction	PL No.	mg on filter	in Exhaust
113	Pacer	Disabled EGR	11008	10.61	193
121	Malibu	Rich Best Idle	11005	3.66	44
135	Malibu Cal.	Dis. Air Pump & R.B.I.	11003	4.88	59
142	Granada	12% Misfire	11007	5.89	107
154	Mustang II	High Oil Consumption	11004	17.54	211

Regulated emissions results were taken for the cars operated on the 9-m^3/min CVS (Cars 121, 135, and 154). These results, along with previously obtained results, were as follows:

	Emissions, g/km (Fuel in l/100 km)							
	During PF Tests				Previously Determined			
Car	HC	CO	NO_x	Fuel	HC	CO	NO_x	Fuel
113	--	--	--	--	--	--	--	--
121	1.2	36	0.6	15.2	1.1	26	0.6	14.7
135	1.4	60	0.3	18.9	1.2	53	0.3	17.9
142	--	--	--	--	--	--	--	--
154	0.6	6	0.8	15.1	0.5	6	0.9	15.4

TABLE 12. IDLE EMISSIONS DURING FTP CYCLE

		Hydrocarbons as C		Carbon Monoxide		Carbon Dioxide	
Test No.	Configuration	Dilute ppm	Approx. Raw ppm Wet	Dilute ppm	Approx. Raw % Dry	Dilute %	Approx. Raw % Wet
114-1	Unmodified	10	250	117	0.30	0.45	11.4
111-2	Rich Best Idle	64	1210	1848	3.5	0.47	8.9
112-2	12% Misfire	434	8340	219	0.42	0.45	8.7
113-2	Disabled EGR	43	1170	120	0.33	0.43	11.7
114-2	High Oil Consumption	66	1940	117	0.34	0.37	10.9
121-1	Unmodified	36	860	1	<0.01	0.49	11.7
121-2	Rich Best Idle	110	2310	1085	2.3	0.44	9.2
122-2	12% Misfire	10	280	5	0.02	0.41	11.5
123-2	Disabled EGR	1	30	1	<0.01	0.34	11.5
124-2	High Oil Consumption	2	60	77	0.21	0.42	11.6
131-1	Unmodified	12	270	17	0.04	0.54	12.0
131-2	Rich Best Idle	46	790	45	0.08	0.70	12.1
132-2	12% Misfire	14	300	8	0.02	0.55	11.8
133-2	Disabled EGR	6	130	5	<0.01	0.53	11.8
135-2	No Air Inj. + R.B.I.	120	2070	2240	3.9	0.47	8.1
141-1	Unmodified	8	180	17	0.04	0.54	12.0
141-3	Rich Best Idle	79	1420	1394	2.5	0.55	9.9
142-2	12% Misfire	62	1200	4	0.01	0.62	12.0
143-2	Disabled EGR	28	470	25	0.04	0.72	12.1
145-2	No Air Inj. + R.B.I.	201	350	2922	5.1	0.39	6.8
152-1	Unmodified	7	150	4	<0.01	0.56	11.7
151-2	Rich Best Idle	25	420	3454	5.9	0.35	5.9
152-3	12% Misfire	35	750	18	0.04	0.55	11.8
153-2	Disabled EGR	8	170	10	0.02	0.56	12.1
154-2	High Oil Consumption	25	530	65	0.14	0.56	11.9

Note: Idle values were taken during seconds 153 to 163 in the Hot-Start UDDS of the FTP (in some configurations other idles produced different values).

The regulated emissions and the fuel consumption values repeated well.

Based on the particulate weight on the filter and the total and sample flow rates, the total calculated exhaust particulate rates for these evaluations came out to be considerably lower than the rates calculated in the total particulate evaluations, which utilized glass fiber filters. It should be emphasized that these evaluations utilized a different filter material and that these comparisons are also based on different runs.

An in-house study of particulate collection efficiency using various filtration media was conducted in early 1978 using diesel exhaust. In that study, the particulate collected on Pallflex filters was consistently lower than that collected on glass fiber filters. At low-power modes the weight gain on the Pallflex filter was less than half the weight gain on a glass fiber filter, whereas, as the engine power output was increased, the difference decreased. The findings in the previous in-house study and in this malfunction project are in general agreement in that the particulate weight gain with Pallflex filters has generally been lower than the weight gain with glass fiber filters. It has not been determined, however, whether the reason is the same for gasoline engine exhaust as for diesel exhaust. A definite relationship for the exhaust particulate collection efficiencies of these two filter medias remains to be established.

VI. ANALYSIS OF THE RESULTS

This section reports the analyses performed on the emissions data generated in this project. These analyses involved averaging and reformatting to enable making various comparisons of the data. Due to the very limited number of data points for each emission at each specific condition, advanced statistical analyses were judged to be inapplicable. Another limitation of further analyses was that no criteria were available to enable establishing acceptable or unacceptable concentrations of each emission in the exhaust. This precluded establishing the significance of the changes in emission levels that occurred. For example, a hundredfold increase in one emission does not necessarily represent a greater hazard than a tenfold, or possibly even lesser, increase in another emission.

Therefore, this section presents the data in formats that enable ready review and comparison. It is generally left up to the individual readers to apply their own interpretation as to the significance of the changes in the emission levels under the various operating conditions.

A. Average Values for the Unmodified Configuration

The initial analyses of the data involved averaging of the four evaluations conducted with each car in the unmodified configuration (i.e., tuned-up to manufacturer's specifications). These averages, along with the maximum and minimum values, are presented in Appendix F.

Car 11 did not have an oxidation catalyst, Cars 12 and 15 had an oxidation catalyst but no air pump, and Cars 13 and 14 had an oxidation catalyst and an air pump. The average emission results, in the unmodified configuration for these three car groupings, are given in Table 13. The non-catalyst Car 11 produced the highest levels of total and individual hydrocarbons, carbon monoxide, oxides of nitrogen, particulates, aldehydes and cyanides and the lowest level of nitrous oxide. The catalyst cars not having an air pump, Cars 12 and 15, produced the highest level of nitrous oxide and the lowest levels of particulates. The catalyst cars having an air pump, Cars 13 and 14, produced the highest levels of sulfates and the lowest levels of carbon monoxide. In general, hydrocarbons and carbon monoxide were consistently higher for the FTP than for the SET and HFET with all five cars. This apparently resulted from the fact that the SET and HFET are hot-start tests which begin with a hot catalyst.

B. Average Values for the Malfunction Configuration

The average values for the unmodified configuration, along with the average values for the malfunction configurations, are given in Appendix G.

TABLE 13. AVERAGE VALUES FOR UNMODIFIED CONFIGURATION

In mg/km, Except as Noted

	FTP			SET			HFET		
	Car 11	Cars 12&15	Cars 13&14	Car 11	Cars 12&15	Cars 13&14	Car 11	Cars 12&15	Cars 13&14
Regulated Emissions									
Hydrocarbons,(THC),g/km	0.73	0.32	0.23*	0.37	0.08	0.07	0.31	0.05	0.06
Carbon Monoxide, g/km	11.14	4.47	1.82	3.65	0.87	0.56*	2.11	0.43	0.23
Oxides of Nitrogen,g/km	1.21	0.89*	0.83*	1.24	0.94	0.65*	1.40	0.98	0.64*
Particulates									
Total Particulates	31.3	5.8	5.5 *	14.8	2.3 *	4.7	12.9	1.7 *	7.5 *
Sulfate	0.68	0.77*	0.94*	0.32	0.31*	3.27	0.24	0.39*	5.53*
Compound Group Totals									
Aldehydes & Ketones	13.38	2.20*	2.82*	14.00	1.20*	1.6 *	16.6	1.1	1.5
Individual Hydrocarbons	316.	141.	101.	138.	46.	39.	161.	32.	37.
Organic Sulfides	0.20	0.37*	0.18*	0.07	0.20	0.08	0.07	0.10*	0.08
Organic Amines	0.03	<0.01	0.02*	0.02	0.01	0.00	0.01	0.03*	0.00
Other Compounds									
Ammonia	3.05	3.06	3.64*	--	--	--	--	--	--
Cyanide & Cyanogen	2.35	0.54	0.17*	0.79	0.10	0.03	1.60	0.11*	0.08
Hydrogen Sulfide	0.04	0.06*	0.00	0.00	0.05*	<0.01	0.00	0.19**	<0.01
Nickel Carbonyl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrous Oxide	3.	34.	18. *	3.	25.	6. *	4.	16.	3.

Car 11 - Non-catalyst car with an air pump.
Cars 12 & 15 - Catalyst without an air pump.
Cars 13 & 14 - Catalyst with an air pump.

*Relatively large variation in the data.
**Extremely large variation in the data.

No method was found to further condense all of these averaged data into a single meaningful table or figure. Therefore, various results were separated out and are discussed in the following sections.

C. Analyses of Regulated Emissions and Fuel Consumption

The analyses of the regulated emissions and fuel consumption results were straightforward since test-to-test repeatability was generally good. A summary of the regulated emissions and fuel consumption data is presented in Table 14. These data are discussed separately as follows:

FTP Regulated Emissions - Hydrocarbons emissions were higher under conditions of "rich best idle" and 12 percent misfire. The highest value (10.8 g/km) was obtained with the 1977 AMC Pacer operating with 12 percent misfire. This car does not have a catalyst. The higher values for carbon monoxide generally occurred with the "rich best idle" operating condition. Disabled EGR produced the higher values for oxides of nitrogen. The highest values for oxides of nitrogen (4 g/km) occurred with the two Ford cars operating without EGR.

Hydrocarbons and carbon monoxide emissions were increased with all malfunctions except disabled EGR. Oxides of nitrogen emissions increased only with the 12 percent misfire and the disabled EGR configurations. The values obtained for the regulated emissions, with the five cars, are compared to the light-duty emissions standards as follows:

	Number Exceeding 1977 and 1978 Emission Standards					
	Unmod.	Rich Best Idle	Misfire	Disabled EGR	High Oil Cons.	No. Air Inj. & R.B.I.
Hydrocrabons	0	2	5	0	1/3[a]	2/2
Carbon Monixide	1[a]	4	1[a]	1[a]	2/3	2/2
Oxides of Nitrogen	0	0	3	4	0.3	0/2

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[a] Emission standard exceeded with the car that did not have a catalyst

As shown, all cars exceeded the hydrocarbon standard with the 12 percent misfire malfunction configuration. Four of the five exceeded the carbon monoxide standard at "rich best idle" and exceeded the oxides of nitrogen standard with the disabled EGR.

Fuel Consumption - Fuel consumption results, in the unmodified configuration, generally repeated reasonably well. These data are summarized as follows:

TABLE 14. SUMMARY OF AVERAGE FTP REGULATED EMISSIONS AND FUEL CONSUMPTION DATA

		Malfunction				
	Unmodified	Rich Best Idle	12% Misfire	Disabled EGR	High Oil Cons.	R.B.I. & Disabled Air Pump
Car 11, AMC Pacer						
Hydrocarbons, g/km	0.7	0.8	10.8	0.8	1.1	--
Carbon Monoxide, g/km	11.1	20.8	14.5	12.6	24.7	--
Oxides of Nitrogen, g/km	1.2	1.2	1.7	2.3	1.2	--
Fuel Cons., ℓ/100 km	14.5	15.7	15.6	14.3	15.0	--
Car 12, Malibu						
Hydrocarbons, g/km	0.3	1.1	1.8	0.3	0.6	--
Carbon Monoxide, g/km	5.5	26.0	6.8	6.3	10.8	--
Oxides of Nitrogen, g/km	0.8	0.6	0.9	1.1	0.6	--
Fuel Cons., ℓ/100 km	13.7	14.7	14.5	13.2	13.9	--
Car 13, Malibu Calif.						
Hydrocarbons, g/km	0.2	0.2	1.1	0.2	--	1.2
Carbon Monoxide, g/km	2.2	3.4	2.3	1.6	--	52.9
Oxides of Nitrogen, g/km	0.4	0.4	0.7	1.4	--	0.3
Fuel Cons., ℓ/100 km	17.4	19.0	17.8	15.2	--	17.9
Car 14, Granada						
Hydrocarbons, g/km	0.3	0.6	1.7	0.4	--	2.3
Carbon Monoxide, g/km	1.5	19.7	2.0	1.9	--	50.6
Oxides of Nitrogen, g/km	1.2	0.6	1.7	4.1	--	0.6
Fuel Cons., ℓ/100 km	15.2	17.2	16.1	15.5	--	16.4
Car 15, Mustang II						
Hydrocarbons, g/km	0.3	2.2	1.6	0.3	0.5	--
Carbon Monoxide, g/km	3.3	47.0	3.9	2.6	5.7	--
Oxides of Nitrogen, g/km	1.0	0.8	1.3	4.2	0.9	--
Fuel Cons., ℓ/100 km	14.9	17.2	16.7	15.1	15.4	--

Note: Values given are the average of up to four tests for the unmodified and two tests for the malfunction conditions.

Unmodified Vehicle Fuel Consumption
Repeatability, ℓ/100 km

Car	MDDS[a]	FTP[a]	SET[a]	HFET[a]
11	14.7-15.2	13.6-14.9	10.9-11.8	9.9-10.9
12	15.8-16.7	13.1-14.0	10.2-10.9	9.3-9.8
13	19.6-20.6	17.0-17.6	13.2-14.0	11.0-12.1
14	15.2-15.9	14.9-15.9	11.5-12.2	10.0-11.4
15	14.9-17.3[b]	14.9-18.2[b]	12.0-12.8	10.5-11.7[b]
15	14.8-15.3[c]	14.9-15.1[c]	12.0-12.1[c]	10.5-11.3[c]

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[a] Minimum and maximum for four tests

[b] Difference exceeds ten percent - in each case the first test produced the highest fuel consumption

[c] Excluding the initial unmodified configuration evaluations

With Car 15 the fuel consumption was relatively high on the initial MDDS road operation and on the initial unmodified test sequence. The regulated emissions, however, were not sufficiently different to identify the cause for this large a variation in fuel consumption.

Exclusive of the initial Car 15 unmodified test sequence evaluations, the percentage difference between the minimum and maximum fuel consumption values, for all unmodified and malfunction evaluations, were as follows:

(Maximum - Minimum)/Avergae, in percent

	MDDS	FTP	SET	HFET
Lowest	3%	1%	1%	5%
Highest	6%	9%	8%	13%
5-Car Average	4%	5%	5%	9%

This amount of variation for this type of operation is considered to be very good for the MDDS, FTP and SET operation and acceptable for the HFET.

D. General Effects of Malfunctions on Emissions

In this section an attempt has been made to give the reader a general idea of the effects of car and malfunction configuration on emissions. Due to the diversity of cars evaluated and the lack of established levels of significance for the unregulated emissions, it can not be established at this time whether or not any of the changes in emissions levels are a definite cause of concern.

An evaluation that can provide some insight is whether the respective malfunctions caused increases in emissions relative to the unmodified configuration. The results of such an evaluation for the FTP results are summarized in Table 15. Hydrocarbons and carbon monoxide increased with essentially all of the malfunction conditions evaluated, except disabled EGR. Oxides of nitrogen increased with the 12 percent misfire and the disabled EGR.

TABLE 15. RELATIONSHIP OF MALFUNCTION TO UNMODIFIED EMISSION RESULTS

	Number of Cars for Which Emissions Increased out of the Total Cars Evaluated in that Configuration				
	Rich Best Idle	12% Misfire	Disabled EGR	High Oil Consump.	No Air Injt. R.B.I.
Regulated Emissions					
Hydrocarbons, (THC), g/km	4/5	5/5	a	3/3	2/2
Carbon Monoxide, g/km	5/5	5/5	a	3/3	2/2
Oxides of Nitrogen, g/km	0/5	5/5	5/5	0/3	0/2
Particulates					
Total Particulates	2/4	4/5	3/5	3/3	2/2
Sulfate	1/5	2/5	0/5	3/3	1/2
Compound Group Totals					
Aldehdyes & Ketones	4/5	5/5	5/5	1/3	1/2
Individual Hydrocarbons	4/4	2/2	1/2	---	---
Organic Sulfides	2/3	2/4	0/3	1/3	1/2
Organic Amines[b]	5/5	1/4	2/5	1/3	1/2
Other Compounds					
Ammonia	3/5	3/5	2/5	---	1/1
Cyanide & Cyanogen	4/5	3/5	5/5	---	1/1
DMNA[c]	---	---	---	---	---
Hydrogen Sulfide	4/5	1/5	1/5	1/3	2/2
Nickel Carbonyl[d]	---	---	---	---	---
Nitrous Oxide	2/5	2/3	3/3	0/1	1/2
Other Elements[c]					

---

[a] Changes were relatively minor and inconsistent

[b] Changes in organic amines were relatively minor

[c] Discussed separately

[d] No nickel carbonyl was detected for any configuration evaluated

E. Other Elements and DMNA

An illustrative summary of the elemental analyses results, for the FTP evaluations, is given in Table 16. As shown in this table, the emission levels of phosphorus, barium, magnesium, chlorine and zinc were associated with the rate of lubricant consumption. Measurable quantities of aluminum were found

TABLE 16. ILLUSTRATIVE SUMMARY OF THE ELEMENTAL ANALYSES FOR THE FTP

Test	Exhaust Emission, mg/km							
	P	Al	S	Fe	Ba	Mg	Cl	Zn
Task 1		≈0.02	≈0.04	0 to 0.4				
11U			0.05	0.1				
111			0.04	0.1				
112			0.08	0.1				
113			0.02	0.1				
114	0.5		0.1	0.4	0.7	0.25	0.09	0.35
12U		0.01	0.01	<0.1				
121		0.03	0.03	0.5				
122		0.02	0.03	0.1				
123		0.01	----	---				
124	0.24	0.01	0.04	<0.1	0.5	0.19	0.12	0.14
13U		0.02	0.2	<0.1				
131		0.02	0.7	<0.1				
132		0.04	0.8	0.4				
133		0.01	0.6	Nil				
135		0.02	0.01	Nil				
14U			0.2	0.1				
141			0.02	<0.1				
142			0.09	0.3				
143			0.03	<0.1				
145			0.01	<0.1				
15U			0.05	*				
151			0.02	0.1				
152			0.1	---				
153			0.02	0.1				
154	0.35		0.08	0.2	0.6	0.22	0.23	0.28

P - Phosphorus
Al - Aluminum
S - Sulfur
Fe - Iron
Ba - Barium
Mg - Magnesium
Cl - Chlorine
Zn - Zinc

Test	General Description
1XU	Unmodified Configuration
1X1	Rich Best Idle
1X2	12 Percent Ignition Misfire
1X3	Disabled EGR
1X4	High Oil Consumption (500 km/litre)
1X5	Rich Best Idle plus Air Pump Disconnected

*High Fe in initial test in the Unmodified Configuration (151-11) makes the average value questionable.

only in the samples from the General Motors automobiles (Task 1, Car 12 and Car 13). On a cursory basis, there appeared to be a relationship between the sulfate emission levels and the level of sulfur determined in the elemental analyses. Also, lubricant consumption appeared to have some minor effect on the level of sulfur detected.

There was no discernable relationship between the engine configuration and the amount of iron emitted. Of interest, however, was that the emission level of iron in the first unmodified configuration test for Car 15 was 0.72 mg/km, the highest value reported for any of the tests. That same test had a significantly higher fuel consumption than did subsequent tests in this same configuration.

Lead emissions were not detected in the sample filters, except when similar levels were also detected in the filter blank or when measurable levels of bromine were also detected. After careful consideration of all the data and the fact that all filters were from the same production lot, it was concluded that the lead values should have been consistent, except when lead contamination of the fuel occurred. With lead contamination of the fuel, a measurable amount of bromine should be present. Therefore, since bromine was generally not present for those tests associated with a blank which was reported to have had a measurable quantity of lead, the measured lead values for such tests have been omitted from the illustrative summary in Table 16.

Three tests had measurable quantities of both lead and bromine. Results for these three tests are summarized as follows:

Test No.	Emissions, mg/km		Calculated Lead in Fuel	
	Bromine	Lead	g/litre	g/gal.
112-13	0.46	0.70	0.007	0.025
133-12	0.50	0.60	0.004	0.016
141-11	0.15	0.41	0.003	0.010

Although considerable precautions were practiced, it appears that the fuel used in these three tests may have become contaminated by a relatively minute amount of leaded fuel. For reference, the lead specification for the fuel used in this project was that it contain less than 0.01 g/gal. The actual lead concentration in the fuel was less than the minimum procedural detection value of 0.001 g/gal.

Since the most significant contributor to these elemental emissions was high oil consumption, a qualitative X-ray analysis was conducted on the unused oil. It was determined that those elements found in the exhaust, when operating with high oil consumption, were present in the unused oil. No detectable quantity of aluminum or iron was found to be present in the oil. The DMNA results are summarized in Table 17. These results were based on single ion monitoring (m/e 74) and interference may result from materials having background ions of m/e 74 ($C_2H_8N_3$, $C_2H_4NO_2$, $C_2H_6N_2O$, C_3H_3Cl, $C_3H_6O_2$ or $C_3H_{10}N_2$) if at the same retention time of DMNA. Referring to Table 17, there does not appear to be any definite consistency in the values relative

TABLE 17. ESTIMATED LEVELS OF DMNA IN FTP TESTS

		DMNA[a]			
Test No.	Configuration	µg/m^3 in raw exhaust[b]	ng in cartridge[c]	µg/m^3 in sample[d]	mg/km[e]
113-1	Unmodified	0	0	0.00	0.00
113-2	No EGR	7	2	0.04	0.01
113-3	" "	78	21	0.42	0.11
123-1	Unmodified	0	0	0.00	0.00
124-1	"	104	28	0.56	0.15
121-2	Rich Best Idle	0	0	0.00	0.00
122-2	12% Misfire	96	26	0.52	0.14
122-3	" "	11	3	0.06	0.02
123-3	No EGR	0	0	0.00	0.00
132-1	Unmodified	78	21	0.42	0.11
132-2	12% Misfire	0	0	0.00	0.00
132-3	" "	0	0	0.00	0.00
133-3	No EGR	0	0	0.00	0.00
135-2	R.B.I. w/o Air	155	42	0.84	0.22
135-3	" " "	52	14	0.28	0.07
142-1	Unmodified	0	0	0.00	0.00
143-1	"	0	0	0.00	0.00
145-1	"	70	19	0.38	0.10
142-2	12% Misfire	0	0	0.00	0.00
142-3	" "	0	0	0.00	0.00
143-2	No EGR	26	7	0.14	0.04
143-3	" "	31	8	0.17	0.04
152-1	Unmodified	10	3	0.05	0.01
153-1	"	<1	-	0.00	0.00
152-2	12% Misfire	0	0	0.00	0.00
152-3	" "	52	14	0.28	0.07

---

[a] Total compounds detected using specific ion (m/e 74) monitoring, some or all of which may be DMNA.

[b] Values are for faw exhaust gas, undiluted, calculated from 185:1 dilution factor and 50ℓ sample.

[c] ng per cartridge = ng/ℓ × 50ℓ / 185 d.f. = 0.27 × ng/ℓ

[d] ng/ℓ in sample = ng/ℓ in raw exhaust / 185 d.f.

[e] mg/km = ng/ℓ in raw exhaust / d.f. × CVS flow / distance × 0.001
= ng/ℓ in raw exhaust / 11.1 × 285 m^3 / 17.85 km × 0.001
= 0.00144 × ng/ℓ in raw exhaust

Note: ng/ℓ = µg/m^3 = 30 ppb for DMNA

to engine configuration. The reported values for each engine configuration, in units of μg/m^3 for the undiluted exhaust, are summarized as follows:

Car No.	Configuration				
	Unmod.	R.B.I.	12% M	No EGR	R.B.I. w/o Air
11	0	--	--	7 & 78	--
12	0 & 104	0	11 & 96	0	--
13	78	--	0 & 0	--	52 & 155
14	0, 0 & 70	--	0 & 0	26 & 31	--
15	4 & 10	--	0 & 52	--	--

As can be readily seen from these data, there was generally poor repeatability for the DMNA results. Therefore, it can only be concluded from these data that additional research is required to confirm the presence or absence of DMNA in automobile exhaust.

F. Maximum Emission Values

The highest of the averaged values for all five cars were determined and these data are presented in Table 18. The data listed in Table 18 are the highest of the averaged emission rates obtained with any of the five cars. These data are listed separately for the unmodified and for the malfunction configurations. The last pages of Table 18 identify the car test which produced this maximum value.

Table 18 is intended to provide some insight into which compound may be of potential concern. After "threshold levels for concern" are established for the unregulated emissions, this table will enable ready screening to determine which of the unregulated emissions may be a potential cause for concern; and perhaps aid in setting priorities for further investigation into possible hazardous toxicity effects. Further review of the results given in Appendix G, would then be required to establish whether or not concern is actually justified.

Another analysis considered was the percentage change in emission rates for each malfunction condition relative to the unmodified configuration. Two considerations tend to preclude the usefulness of such an analysis: One consideration was that the concentrations for some of the compounds were near the "minimum detection value". Percentage change for these compounds would be essentially meaningless. A second consideration was the previously mentioned lack of "threshold levels for concern".

G. Relative Importance of the Maximum Emission Rates

There are proposed or established automotive source emission standards for four of the compounds evaluated in this project. Such standards can be utilized in a comparative analyses of the emission results for those compounds. For most of the compounds evaluated, however, standards have not been established and attempted analyses of relative importance requires the application of some other available criteria.

TABLE 18. HIGHEST OF THE AVERAGED EMISSION RATES

	Emission Rate, mg/km (Except as Noted)					
	FTP		SET		HFET	
	Unmod.	Malf.	Unmod.	Malf.	Unmod.	Malf.
Regulated Emissions						
Hydrocarbons, g/km	0.7	10.8	0.4	8.1	0.3	7.5
Carbon Monoxide, g/km	11.1	52.9	3.7	23.6	2.1	9.3
Oxides of Nitrogen, g/km	1.2	4.2	1.2	5.1	1.4	4.9
Particulates						
Total Particulates	31.3	48.2	14.8	29.6	12.9	25.0
Sulfate	1.2	9.4	3.8	17.0	8.5	13.8
Compound Group Totals						
Aldehydes & Ketones	13	124	14	152	17	228
Individual Hydrocarbons	316	1354	138	659	161	1224
Organic Sulfides	0.5	1.2	0.2	2.1	0.2	1.0
Organic Amines	<0.1	0.2	<0.1	0.1	<0.1	0.1
Other Compounds						
Ammonia	5.4	56.6	--	29.0	--	13.3
Cyanide & Cyanogen	2.4	6.2	0.8	2.0	1.6	7.1
DMNA	--	--	--	--	--	--
Hydrogen Sulfide	0.1	0.7	0.1	4.3	0.4	1.4
Nickel Carbonyl	0.00	0.00	0.00	0.00	0.00	0.00
Nitrous Oxide	41	60	29	70	17	27
Aldehydes and Ketones						
Formaldehyde	9.7	75.2	10.7	89.5	10.9	150.5
Acetaldehyde	2.4	31.0	2.5	39.9	3.8	51.0
Acetone	0.8	10.0	0.4	13.7	1.0	14.6
Isobutyraldehyde	<0.1	<0.1	0.0	0.4	0.0	0.7
Methyl Ethyl Ketone	0.4	5.3	0.7	6.3	0.7	8.8
Crotonaldehyde	--	--	--	--	--	--
Hexanaldehyde	0.2	2.1	0.3	2.4	0.3	3.1
Benzaldehyde	--	--	--	--	--	--
Individual Hydrocarbons						
Methane	60	258	25	99	22	49
Ethylene	83	302	46	102	51	203
Ethane	14	48	10	20	9	16
Acetylene	35	53	15	18	16	24
Propane	5	16	1	4	3	4
Propylene	38	96	20	66	22	179
Benzene	40	230	18	103	20	172
Toluene	60	800	22	373	27	593

TABLE 18 (CONT'D). HIGHEST OF THE AVERAGED EMISSION RATES

	Emission Rate, mg/km					
	FTP		SET		HFET	
	Unmod.	Malf.	Unmod.	Malf.	Unmod.	Malf.
Organic Sulfides						
Carbonyl Sulfide	0.21	1.06	0.14	2.03	0.07	1.00
Methyl Sulfide	0.22	0.15	0.09	0.10	0.05	0.15
Ethyl Sulfide	0.06	0.20	0.05	0.44	0.05	0.33
Methyl Disulfide	0.02	0.06	0.00	0.14	0.01	0.02
Organic Amines						
Monomethylamine	0.01	0.08	0.01	0.07	0.03	0.05
Monoethylamine	0.02	0.10	0.01	0.08	0.03	0.13
Trimethylamine	0.00	0.12	0.00	0.03	0.00	0.02
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00
Other Elements						
Chromium						
Lead						
Manganese						
Arsenic						
Mercury						
Bromine						
Phosphorus		0.48		0.51		0.21
Silicon				0.01		0.21
Cadmium						
Aluminum	0.02	0.04		0.06		0.05
Sulfur	0.21	0.86		5.55		3.45
Sodium				0.04		
Fluorine						
Magnesium		0.25		0.19		0.14
Potassium				0.01		0.01
Chlorine		0.23		0.16		0.10
Platinum						
Zinc		0.35		0.32		0.25
Copper						0.03
Nickel						
Iron	0.42	0.51		0.21		0.07
Vanadium						
Titanium						
Barium		0.72		0.56		0.37
Cesium						
Calcium				0.02		0.03
Tin						
Antimony						
Palladium						

Note: Values for all spaces left blank for "Other Elements" are 0.00.

TABLE 18 (CONT'D). HIGHEST OF THE AVERAGED EMISSION RATES

	Car Test Number					
	FTP		SET		HFET	
	Unmod.	Malf.	Unmod.	Malf.	Unmod.	Malf.
Regulated Emissions						
Hydrocarbons	11	112	11	112	11	112
Carbon Monoxide	11	135	11	135	11	135
Oxides of Nitrogen	14	153	11	143	11	143
Particulates						
Total Particulates	11	112	11	133	11	112
Sulfate	14	154	14	133	14	133
Compound Group Totals						
Aldehydes & Ketones	11	112	11	112	11	112
Individual Hydrocarbons	11	112	11	112	11	112
Organic Sulfides	12	121	15	135	15	135
Organic Amines	11&14	112	11&15	121	15	121
Other Compounds						
Ammonia	13	151	--	151	--	121
Cyanide & Cyanogen	11	151	11	151	11	112
DMNA	--	135	--	--	--	--
Hydrogen Sulfide	15	145	15	135	15	145
Nickel Carbonyl	--	---	--	---	--	---
Nitrous Oxide	12	143	12	123	12	121
Aldehydes and Ketones						
Formaldehyde	11	112	11	112	11	112
Acetaldehyde	11	112	11	112	11	112
Acetone	11	112	14	112	11	112
Isobutyraldehyde	15	121,124, 142	--	112	--	141
Methyl Ethyl Ketone	11	112	11	112	11	112
Crotanaldehyde	--	---	--	---	--	---
Hexanaldehyde	11	143	--	112	15	112
Benzaldehyde	--	---	--	---	--	---
Individual Hydrocarbons						
Methane	13	151	15	151	13	151
Ethylene	11	151	11	151	11	112
Ethane	14	151	14	151	14	112
Acetylene	11	111	11	111	11	112
Propane	11	152	11&15	151	11	112
Propylene	11	112	11	112	11	112
Benzene	11	112	11	112	11	112
Toluene	11	112	11	112	11	112

TABLE 18 (CONT'D). HIGHEST OF THE AVERAGED EMISSION RATES

	Car Test Number					
	FTP		SET		HFET	
	Unmod.	Malf.	Unmod.	Malf.	Unmod.	Malf.
Organic Sulfides						
Carbonyl Sulfide	12	121	12	135	15	135
Methyl Sulfide	12	132	15	132	11	151
Ethyl Sulfide	13	151	13	121	13	151
Methyl Disulfide	11	111	--	121	15	135
Organic Amines						
Monomethylamine	11&15	112	11	112	15	112
Monoethylamine	11	121	11&15	121	15	121
Trimethylamine	--	112	--	111	--	111
Diethylamine	--	---	--	---	--	---
Triethylamine	--	---	--	---	--	---
Other Elements						
Chromium						
Lead				124		
Manganese						
Arsenic						
Mercury						
Bromine						
Phosphorus		114		114		114
Silicon				114,124,142, 133,142,152, 154		114
Cadmium						
Aluminum	13	132		121		121
Sulfur	13	132		133		143
Sodium				114		
Fluorine						
Magnesium		114		114		154
Potassium				154		133
Chlorine		154		124		124
Platinum						
Zinc		114		114		114
Copper						113
Nickel						
Iron	14	121		121		121&142
Vanadium						153
Titanium						
Barium		114		114		154
Cesium						
Calcium				114&152		142
Tin						
Antimony						
Palladium						

The data from Table 18 were converted into units of mg/m^3 in the undiluted exhaust and these converted data are presented in Table 19. Table 19 also lists the Threshold Limit Values for those substances included in the "Registry of Toxic Effects of Chemical Substances".(9) Some additional FTP relative values for the unregulated emissions are given as follows for reference purposes:

	Mass Emission Rate		Equivalent Level in FTP Raw Exhaust[a]
	g/km	g/mi	mg/m^3
HC	0.9	1.5	600
HC	0.25	0.41	150
CO	9.3	15	6000
CO	4.4	7	2700
CO	2.1	3.4	1400
NO_x	1.2	2.0	800
NO_x	0.6	1.0	400
NO_x	0.25	0.41	150

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[a] Approximate values based on the relationship for the five cars evaluated in this project.

The conversion from an emission rate in g/km to mg/m^3 was determined by the total volume of the undiluted exhaust and the total distance driven for each test. The volume of undiluted exhaust differs for each car and for each malfunction condition, generally as a function of the fuel consumption rate. For generating Table 19, and the additional FTP relative values, a relationship was used which tends to correct all data to an equivalent undiluted exhaust flow rate equal to the lowest for any of the five cars. This was done in order to equalize the data to a common basis and eliminate the relative reduction obtained by cars having high exhaust flow rates.

These data are summarized further and compared to the emission standards and the TLV in Table 20. The values summarized in Table 20 are intended to provide some possible idea of the relative importance, based on toxicity, for some of the compounds evaluated. It should be emphasized, however, that definite conclusions are currently inappropriate for any compounds; except possibly those for which automotive source emission standards have been established. It should be recognized that the hazard level of a compound may change based on new findings in health effect research. This is especially a factor when a compound is changed from a toxic concern to a carcinogenic concern; such as is apparently occurring with benzene and formaldehyde. Also, some compounds which are considered by OSHA and other agencies as being nontoxic can have a potential, indirect harmful effect (e.g., nitrous oxide is one example of such a compound due to its potential effect on the atmospheric ozone layer). The ambient air standards were also reviewed for possible inclusion in Table 20. Due to the varied ways in which the standards are expressed, however, there did not appear to be an appropriate method for using such standards in this comparative analyses.

TABLE 19. MAXIMUM EMISSION LEVELS IN THE UNDILUTED EXHAUST[a]

	Approximate Emission Level in Undiluted Exhaust, mg/m^3[b]						TLV,(9) mg/m^3
	FTP		SET		HFET		
	Unmod.	Malf.	Unmod.	Malf.	Unmod.	Malf.	
Regulated Emissions							
Hydrocarbons	500	7,000	300	6,900	300	7,500	--
Carbon Monoxide	7,200	34,400	3,200	20,100	2,100	9,300	55
Oxides of Nitrogen	800	2,700	1,000	4,300	1,400	4,900	9
Particulates							
Total Particulates	20.4	31.3	12.6	25.2	12.9	25.0	--
Sulfate	0.8	6.1	3.2	14.5	8.5	13.8	--
Compound Group Totals							
Aldehydes & Ketones	8.	81.	12.	129.	17.	228.	
Individual Hydrocarbons	205.	880.	117.	560.	161.	1224.	
Organic Sulfides	0.3	0.8	0.2	1.8	0.2	1.0	
Organic Amines	<0.1	0.1	<0.1	<0.1	<0.1	>0.1	
Other Compounds							
Ammonia	3.5	36.8	--	24.7	--	13.3	35
Cyanide & Cyanogen	1.6	4.0	0.7	1.7	1.6	7.1	5^c
DMNA	--	--	--	--	--	--	--
Hydrogen Sulfide	<0.1	0.5	<0.1	3.7	0.4	1.4	20^c
Nickel Carbonyl	0.000	0.000	0.000	0.000	0.000	0.000	0.007
Nitrous Oxide	27.	39.	25.	60.	17.	27.	--
Aldehydes & Ketones							
Formaldehyde	6.3	48.9	9.1	76.1	10.9	150.5	4
Acetaldehyde	1.6	20.2	2.1	33.9	3.8	51.0	360
Acetone	0.5	6.5	0.3	11.7	1.0	14.6	2400
Isobutyraldehyde	<0.1	<0.1	0.0	0.3	0.0	0.7	--
Methylethylketone	0.3	3.5	0.6	5.4	0.7	8.8	590
Crotonaldehyde	--	--	--	--	--	--	6
Hexanaldehyde	0.1	1.4	0.3	2.0	0.3	3.1	--
Benzaldehyde	--	--	--	--	--	--	--
Individual Hydrocarbons							
Methane	39.	168.	21.	84.	22.	49.	--
Ethylene	54.	196.	39.	87.	51.	203.	--
Ethane	9.	31.	9.	17.	9.	16.	--
Acetone	23.	34.	13.	15.	16.	24.	2400
Propane	3.	10.	<1.	3.	3.	4.	1800
Propylene	25.	62.	17.	56.	22.	179.	--
Benzene	26.	150.	15.	88.	20.	172.	33
Toluene	39.	520.	19.	317.	27.	593.	760
Organic Sulfides							
Carbonyl Sulfide	0.14	0.69	0.12	1.73	0.07	1.00	--
Methyl Sulfide	0.14	0.10	0.08	0.09	0.05	0.15	--
Ethyl Sulfide	0.04	0.13	0.04	0.37	0.05	0.33	--
Methyl Disulfide	0.01	0.04	0.00	0.12	0.01	0.02	--

TABLE 19 (CONT'D). MAXIMUM EMISSION LEVELS IN THE UNDILUTED EXHAUST[a]

	Approximate Emission Level in Undiluted Exhaust, mg/m^3[b]						TLV,(9) mg/m^3
	FTP		SET		HFET		
	Unmod.	Malf.	Unmod.	Malf.	Unmod.	Malf.	
Organic Amines							
Monomethylamine	<0.01	0.05	<0.01	0.06	0.03	0.05	--
Monoethylamine	0.01	0.07	<0.01	0.07	0.03	0.13	--
Trimethylamine	0.00	0.08	0.00	0.03	0.00	0.02	--
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	75
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	100
Other Elements							
Chromium	0.00	0.00	0.00	0.00	0.00	0.00	1
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.2
Manganese	0.00	0.00	0.00	0.00	0.00	0.00	5[c]
Arsenic	0.00	0.00	0.00	0.00	0.00	0.00	0.5
Mercury	0.00	0.00	0.00	0.00	0.00	0.00	--
Bromine	0.00	0.00	0.00	0.00	0.00	0.00	0.7
Phosphorus	0.00	0.31	0.00	0.43	0.00	0.21	--
Silicon	0.00	0.00	0.00	<0.01	0.00	0.21	--
Cadmium	0.00	0.00	0.00	0.00	0.00	0.00	0.2
Aluminum	0.01	0.03	0.00	0.05	0.00	0.05	--
Sulfur	0.14	0.56	0.00	4.72	0.00	3.45	--
Sodium	0.00	0.00	0.00	0.03	0.00	0.00	--
Fluorine	0.00	0.00	0.00	0.00	0.00	0.00	0.2
Magnesium	0.00	0.16	0.00	0.16	0.00	0.14	--
Potassium	0.00	0.00	0.00	<0.01	0.00	0.01	--
Chlorine	0.00	0.15	0.00	0.14	0.00	0.10	3
Platinum	0.00	0.00	0.00	0.00	0.00	0.00	d
Zinc	0.00	0.23	0.00	0.27	0.00	0.25	--
Copper	0.00	0.00	0.00	0.00	0.00	0.03	--
Nickel	0.00	0.00	0.00	0.00	0.00	0.00	1
Iron	0.27	0.33	0.00	0.18	0.00	0.07	--
Vanadium	0.00	0.00	0.00	0.00	0.00	0.00	--
Titanium	0.00	0.00	0.00	0.00	0.00	0.00	--
Barium	0.00	0.47	0.00	0.48	0.00	0.37	e
Cesium	0.00	0.00	0.00	0.00	0.00	0.00	--
Calcium	0.00	0.00	0.00	0.02	0.00	0.03	--
Tin	0.00	0.00	0.00	0.00	0.00	0.00	f
Antimony	0.00	0.00	0.00	0.00	0.00	0.00	0.5
Palladium	0.00	0.00	0.00	0.00	0.00	0.00	--

---

[a] Maximum of the average values as given in Table 15.

[b] Derived on a wet basis using the following approximate calculation:
mg/m^3 ≃ Conversion Factor × mg/km. C.F. = Distance/Total Volume x Dilution Factor.
FTP = 0.65 SET = 0.85 HFET = 1.00

[c] Ceiling value.

[d] 0.002 for soluble salts.

[e] 0.5 for soluble compounds.

[f] 2 for inorganic compounds, 0.1 for organic compounds.

TABLE 20. RELATIVE IMPORTANCE OF MALFUNCTION EMISSION RATES

	Maximum Emission Rate (MER) in mg/km[a]	Emission Standard for 1983 in mg/km	Equivalent MER in Undiluted Exhaust in mg/m^3 (MEC)	Threshold Limit Value (TLV)in mg/m^3		Ratio of MEC to TLV
				OSHA(9)	R[e]	
Regulated Emissions						
Hydrocarbons	10800[b]	255	7000	--	--	--
Carbon Monoxide	52900	2113	34400	55	--	625
Oxides of Nitrogen	4200	622[c]	2700	9	--	300
Particulates						
Total Particulates	48[b]	124[d]	31	--	1	31[e](12)[f]
Sulfates	17	--	15	--	1	15[e]
Compound Group Totals						
Aldehdyes & Ketones	228[b]	--	228	--	--	--
Organic Sulfides	2	--	2	--	10	<1[e]
Organic Amines	<1	--	<1	--	>10	<1[e]
Other Compounds						
Ammonia	57	--	37	35	--	1
Cyanide & Cyanogen	7[b]	--	7	--	5	1[e]
Hydrogen Sulfide	4	--	4	--	10	<1[e]
Nickel Carbonyl	0.00	--	0.00	0.007	--	0
Nitrous Oxide	70	--	60	--	--	--
Formaldehyde	151[b]	--	151	4	--	38(2)[f]
Benzene	230[b]	--	182	33	--	5

---

[a] FTP rate recorded for the regulated emissions

[b] Value for non-catalyst car - Highest HC value for catalyst car was 2300

[c] 255 mg/km in California

[d] Proposed for diesel cars

[e] Based on values for some similar or Related compounds as set by OSHA(9) or Recommended by the 1968 American Conference of Governmental Industrial Hygienists(10)

[f] Value for catalyst cars given within the parentheses

With reference to Table 20, the maximum FTP composite emission rates for HC, CO and NO_x greatly exceeded the standards for 1983 (0.41, 3.4 and 1 g/mi for HC, CO, and NO_x). The maximum value for total particulate, however, was less than one half of the proposed 0.2 g/mi particulate standard for 1983 diesel cars.

Also, in Table 20, the maximum emission concentration (MEC) are compared with the Threshold Limit Value (TLV), as established by OSHA for exposure in any 8-hour work shift. For many of the compounds listed, it would appear that the higher the MEC to TLV ratio the more likely the maximum emission rate would be of concern from a toxicity viewpoint.

The maximum undiluted exhaust emission concentrations for carbon monoxide and oxides of nitrogen exceeded the TLV by over 100. Other compounds in the undiluted exhaust, which exceeded an established TLV, include benzene and formaldehyde (the maximum value of ammonia was approximately equal to the TLV). As a matter of possible interest, the value for carbon dioxide was over 20 times the established TLV.

For the remaining compounds and compound groups, it was necessary to estimate an equivalent TLV based on best available data.(9,10) Based on these estimated values, the maximum levels for total particulates and sulfate were above the estimated values for an equivalent TLV by factors of 31 and 15 respectively.

In summary, these comparisons of the emissions results with the TLV's are only intended to provide some relative means of interpreting the data obtained in this project. These relative comparisons generally apply only to toxicity and the hazardous characteristic on an individual component basis. Other areas, such as carcinogenicity and cumulative, synergistic and indirect effects, must be considered before any definite conclusions can be made.

LIST OF REFERENCES

1. Dietzmann, Harry E., et al, "Analytical Procedures for Characterizing Unregulated, Pollutant Emissions from Motor Vehicles", Report EPA-600/2-79-017, February 1979.

2. Code of Federal Regulations, Title 40, Chapter 1, Part 85, Subpart H, Sections applicable to 1977 (and 1978) Model Year Light-Duty Vehicles.

3. Congested Freeway Driving Schedule (Appendix VIII in the Recommended Practice for Measurement of Exhaust Sulfuric Acid Emission from Light-Duty Vehicles and Trucks, November 1976.)

4. Highway Fuel Economy Driving Schedule (Federal Register, Vol. 41, No. 100, May 21, 1976, Appendix I.)

5. 55 mph Alternate Mileage Accumulation Procedure (MSAPC A/C No. 37, December 20, 1973, Enclosure 1).

6. Automotive Environmental Systems, Inc., "A Study of Emissions from Light-Duty Vehicles in Six Cities", APTD-1497, Final Report to the Environmental Protection Agency under Contract No. 68-04-0042, March 1973.

7. M. F. Chew, "Auto Smog Inspection at Idle Only, Part II: Oxides of Nitrogen," Paper 710071 presented at SAE Automotive Engineering Congress, Detroit, January 11-15, 1971.

8. Urban, Charles M. and Springer, Karl J., "Study of Emissions from Heavy-Duty Vehicles," Final Report EPA-460/2-76-012 to the Environmental Protection Agency under Contract No. 68-03-2147, May 1976.

9. U. S. HEW "Registry of Toxic Effects of Chemical Substances," 1976 and 1978 Editions.

10. Proceedings of the 1968 American Conference of Governmnetal Industrial Hygienists as reported in the Fifth Edition of the "Matheson Gas Data Book."

APPENDICES

A - GENERAL INFORMATION
B - TASK I MALFUNCTION SCREENING EVALUATIONS
C - SUMMARIES OF THE RESULTS
D - FTP INDIVIDUAL SAMPLE EMISSIONS RESULTS
E - COMPUTER PRINTOURS OF THE TEST RESULTS
F - AVERAGE VALUES FOR THE UNMODIFIED CONFIGURATION
G - AVERAGE VALUES FOR ALL CONFIGURATIONS

APPENDIX A

GENERAL INFORMATION

A-1 Modified Durability Driving Schedule
A-2 Analytical Procedure for DMNA
A-3 Calculations for Unregulated Emissions

APPENDIX A-1. MODIFIED DURABILITY DRIVING SCHEDULE FOR MILEAGE ACCUMULATION ON PUBLIC ROADS

The following schedule is shown on Figure A-1:

1. Leave Institute Fleet Laboratory

2. Proceed to CULEBRA ROAD via INSTITUTE ROAD, 20 & 30 m.p.h.

3. Stop at CULEBRA

4. Left turn onto CULEBRA and proceed to "A", 410, at 40 m.p.h. (Distance from Fleet Laboratory to "A" is 2.3 miles)

5. Stop at "A", idle 15 sec.

6. Start lap prompter at 1.

7. Accelerate from stop, turn left on access road

8. After left turn, accelerate to lap speed and then decelerate at "B" to 20 m.p.h., as traffic permits.

9. Accelerate to lap speed as you turn onto 410. Continue on 410 to next exit and then decelerate at "C" to 20 m.p.h., as traffic permits then accelerate to lap speed.

10. Continue on FRONTAGE ROAD until a full stop can be safely made at area of point "D". Idle for 15 secs.

11. Accelerate from stop to lap speed and pull onto 410 at next ramp. Continue on 410 to next exit ramp.

12. Take exit, then decelerate to 20 m.p.h., at "E".

13. Accelerate to lap speed.

14. Stop at "F" and idle 15 secs.

15. Accelerate to lap speed and continue to "G". Decelerate to 20 m.p.h., at "G" then accelerate to lap speed.

16. Stop at traffic light if red, "H" (this can be as long as 33 secs.) If the light is green, proceed and make an additional stop along the North lap as traffic permits.

17. As you pass "H" stop light, push the "lap" prompter and observe the "lap speed".

18. Left turn on MARBACH under 410. Stop at light "I". If light is green, proceed on North lap and make additional stop as traffic permits.

19. Left turn to 410 access at "I".

APPENDIX A-1 (CONT'D). MODIFIED DURABILITY DRIVING SCHEDULE FOR MILEAGE ACCUMULATION ON PUBLIC ROADS[a]

20. Proceed up 410 to "J" at lap speed.

21. Decelerate at "J" to 20 m.p.h., and then accelerate to lap speed.

22. Continue to "K" at lap speed.

23. Decelerate at "K" to 20 m.p.h., and then accelerate to lap speed.

24. Take ramp to 410 and proceed up 410 to exit ramp at "L".

25. Decelerate at "L" to 20 m.p.h., then accelerate to lap speed.

26. Proceed to "M", then stop and idle 15 secs.

27. Accelerate to lap speed then decelerate at "N" to 20 m.p.h., and then accelerate to lap speed.

28. Take ramp to 410 and continue on 410 to CULEBRA exit ramp.

29. Take CULEBRA exit to stop at "A". Idle 15 secs.

30. Push "lap" prompter for next lap and lap speed.

31. This begins the 3rd lap.

32. Continue with South lap - North lap sequence until lap number 9 is complete.

33. Lap number 10 is run at a steady 55 m.p.h., on 410. Get on 410 at first entrance ramp following the stop at the end of lap number 9 and stay on 410.

34. Lap 10 is completed when you stop at "A" or "H" after pulling off onto the ramp nearest the stop.

35. After stop at "A" or "H" Lap Number 10 is complete.

36. Punch lap button for Lap 11.

37. Accelerate then stop at "B".

38. Accelerate to lap speed then decelerate to stop at "D".

39. Accelerate to lap speed then decelerate to stop at "F".

40. Accelerate to lap speed then decelerate to stop at "H".

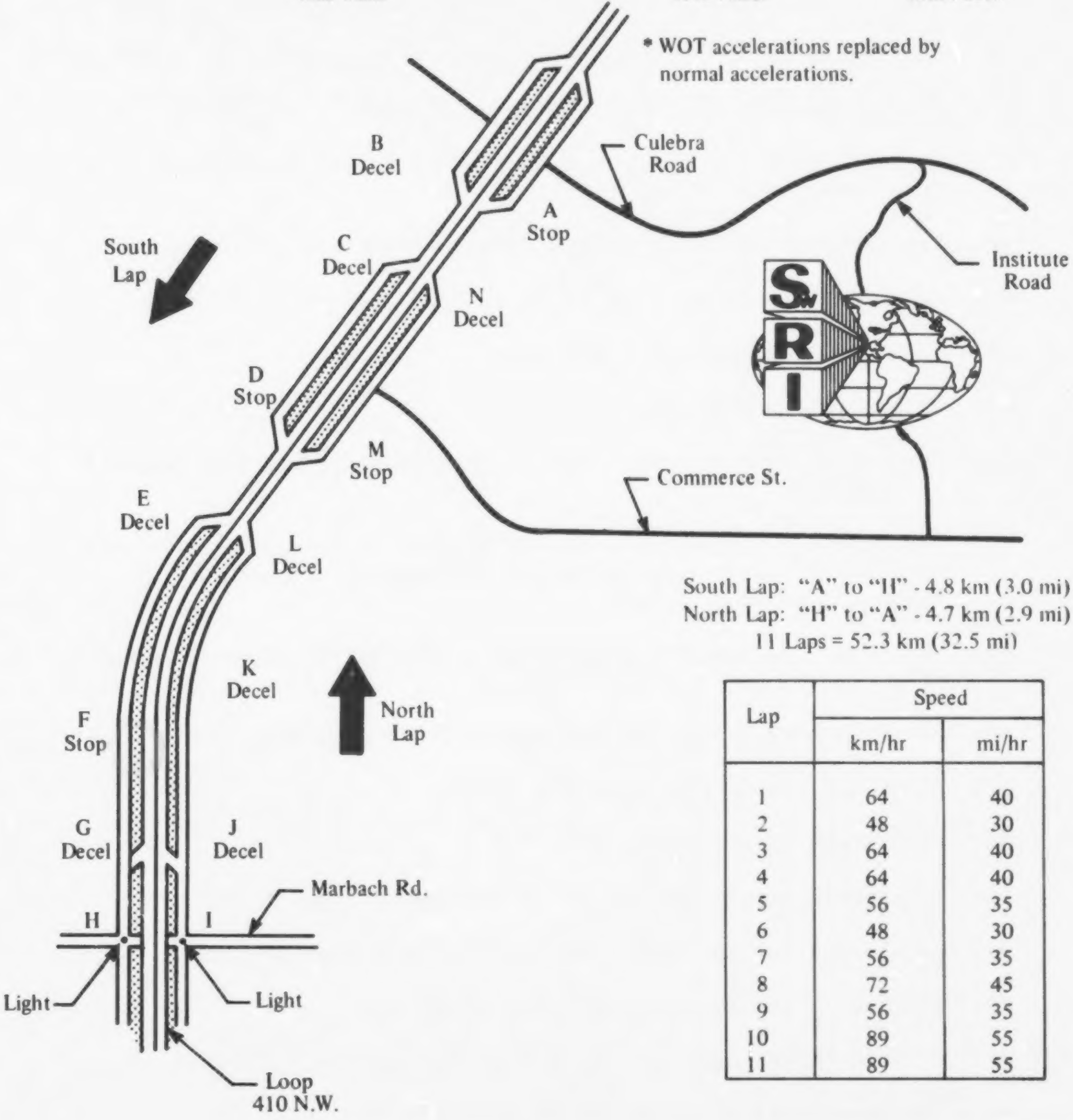
41. This completes one cycle of the mileage accumulation.

42. The next cycle of the schedule begins at "H".

43. Complete as many steps per shift as time will allow, then return to Fleet Laboratory.

Driving Mode	Events Per Mile 55 mph Top Speed SwRI Course*	 AC No. 37
Stops	1.02	1.01
Normal Accelerations from Stop	1.01	0.91
Normal Accelerations from 20 mph	1.11	1.11
Wide-Open Throttle Accelerations and Fast Deceleration	0.00	0.10
Idle Time	13.84 Sec.	13.64 Sec.

* WOT accelerations replaced by normal accelerations.


B Decel
A Stop
Culebra Road
Institute Road
South Lap
C Decel
N Decel
SwRI
D Stop
M Stop
Commerce St.
E Decel
L Decel
K Decel
North Lap
F Stop
G Decel
J Decel
Marbach Rd.
H
I
Light
Light
Loop 410 N.W.

South Lap: "A" to "H" - 4.8 km (3.0 mi)
North Lap: "H" to "A" - 4.7 km (2.9 mi)
11 Laps = 52.3 km (32.5 mi)

Lap	Speed km/hr	Speed mi/hr
1	64	40
2	48	30
3	64	40
4	64	40
5	56	35
6	48	30
7	56	35
8	72	45
9	56	35
10	89	55
11	89	55

Figure A-1. Modified (automobile) durability driving schedule for mileage accumulation on public roads

APPENDIX A-2. ANALYTICAL PROCEDURE FOR DMNA

The following report summary and description of the analytical procedure for DMNA was excerpted from a copy of the Special Interim Technical Report for EPA Contract No. 68-02-2767. The interim report was prepared by Dr. E. D. Pellizzari of the Research Triangle Institute for Dr. Ron Bradow of the Environmental Protection Agency, Research Triangle Park. The procedure described was used by the Research Triangle Institute in performing the DMNA analyses reporting in this final report.

ANALYSIS FOR N-NITROSODIMETHYLAMINE IN EXHAUST GASES USING A TENAX GC CARTRIDGE AND GAS CHROMATOGRAPHY/MASS SPECTROMETRY/COMPUTER

EPA Contract No. 68-02-2767

TRI/1514/00-01S

1.0 Introduction

Research was conducted on determining whether N-nitrosodimethylamine was present in auto exhaust. In conjunction with Southwest Research Institute, a study was conducted on the detection of DMN in auto exhaust of automobiles which have been operated under various test conditions. SwRI was responsible for generating and participating in the collection of the auto exhaust samples during the course of this program. The results of this research effort is described here.

2.0 Experimental Procedures

The collection and analysis techniques developed for use in ambient air modified and used for detecting DMN in auto exhaust gases.

Tenax GC sampling cartridges were prepared at the Research Triangle Institute (RTI) and shipped by Federal Express to Southwest Research Institute (SwRI) for the collection of auto exhaust samples and subsequent returned to RTI for analyses. In all cases the sampling cartridges were expended or returned within four to five weeks and replaced with a fresh batch in order to insure a low background level. All samples were analyzed within two to three weeks after sample collection was completed.

The sampling procedure employed by SwRI consisted of a primary and secondary diluter and the secondary diluter and transfer lines were maintained at 60°C. The sampling rate was 1.6 ℓ/min and the test length was approximately 31 minutes giving a total sample volume of 50 ℓ. The average primary cvs dilution was 11.1 to 1 and the secondary dilution was 16.7 to 1 giving an actual final sample dilution of 185 to 1. The secondary diluter was necessary in order to insure that the NO_x and hydrocarbon values were at levels which minimized the potential artifact formation of the N-nitrosodimethylamine on the Tenax GC sorbent.

3.0 Results and Discussion

Table A-2 presents the results obtained on the analysis of 30 Tenax GC sampling cartridges which were used in the sampling of auto exhaust at the SwRI Dynamometer Facility. Indicated in Table 1 are the Tenax GC cartridge sample numbers with the corresponding SwRI test number. The hydrocarbon and NO_x emission data was provided by SwRI. The hydrocarbon and NO_x data was obtained over three time periods throughout the 31 minute test run. This represents the hydrocarbon emission value data at the primary diluter only. Thus, the Tenax GC sampling cartridge was exposed to a 0.06 times this level.

Also in Table 1 are tentatively indicated the DMN levels observed in each of the samples. The values are given in ng/ℓ per raw auto exhaust. The highest levels are observed in samples 3-10 and 3-14 where the levels were 155 and 104/ ng/ℓ respectively. Several additional samples indicated the presence of DMN and a majority had trace levels or none at all.

These data were based on single ion monitoring (m/e 74) and the confirmation of DMN is required utilizing full scan data. Therefore, the data in Table 1 indicate that DMN may be found in auto exhaust; but additional research is required to confirm its presence in test runs which appeared to provide the conditions of maximum emissions.

N-NITROSODIMETHYLAMINE IN AMBIENT AIR ANALYTICAL METHOD

Analyte:	DMN	Method No:	
Matrix:	Air	Range:	0.5 ppt - 10 ppb
Procedure:	Absorption on Tenax GC, thermal desorption with He purge, measurement by capillary gas-liquid chromatography/ mass spectrometry	Precision:	±10%
Date Issued:		Classification:	E(Proposed)
Date Revised:			

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1. Principle of the Method

N-nitrosodimethylamine (DMN) is concentrated from ambient air on Tenax GC in a short glass tube (1,2). It is desorbed by heating and purging with helium into a liquid nitrogen cooled nickel capillary trap and then introduced into a high resolution gas chromatographic column where it is separated from interferences. The concentration of DMN is measured from the mass spectrometric signal at m/e 74 (3).

Table A-2. ESTIMATED LEVELS OF N-NITROSODIMETHYLAMINE AND DILUTE BAGGED HYDROCARBON AND NO$_X$ EMISSIONS ASSOCIATED WITH FTP TESTS[a]

Tenax Cartridge No.	Test No.	DMNA[b] (ng/ℓ)	HC Emissions, ppm[a]			NO$_x$ Emissions, ppm[a]		
			t_1	t_2	t_3	t_1	t_2	t_3
2-21	122-2	96	980	20	94	43	25	36
2-22	122-3	11	980	27	122	38	25	30
2-23	152-1	10	114	18	32	52	26	44
2-24	143-2	26	140	14	39	172	99	176
2-25	143-3	31	165	15	48	188	97	218
2-26	113-1	ND	140	53	120	55	35	59
2-27	152-2	ND	715	38	146	60	36	46
2-28	152-3	52	745	34	142	59	30	46
2-29	132-1	78	86	19	23	21	11	18
2-30	113-2	7	175	55	110	111	37	122
2-31	113-3	78	176	62	133	115	39	127
2-32	123-1	ND[c]	212	17	36	33	16	29
2-33	132-2	ND	630	37	66	29	19	25
2-34	132-3	ND	451	34	69	30	20	26
2-35	142-1	ND	110	17	30	61	32	40
3- 2	121-2	ND	170	14	30	44	28	48
3- 3	153-1	T(?)	159	19	43	54	26	41
3- 4	123-3	ND	173	15	33	45	27	46
3- 5	142-2	ND	714	40	147	69	45	59
3- 6	142-3	ND	782	42	153	76	45	55
3- 7	153-3	---	129	21	41	186	86	196
3- 8	153-3	---	145	19	44	182	85	190
3- 9	135-1	---	82	17	21	18	9	14
3-10	135-2	155	211	121	112	15	6	12
3-11	---	---	---	---	---	---	--	---
3-12	135-3	52	228	122	108	16	6	11
3-13	145-1	70	103	17	43	55	31	39
3-14	124-1	104	145	12	20	38	14	35
	133-3	ND	---	---	---	---	---	---
	143-1	ND	---	---	---	---	---	---

[a] Hydrocarbon and NO$_x$ emission values associated with FTP tests were obtained by Southwest Research Institute. Levels are obtained from the CVS (1° dilution only).

[b] Values are for raw exhaust gas, undiluted, calculated from 185:1 dilution factor and 50 ℓ sample

[c] ND = not detected

2. Range and Sensitivity

2.1 The range of the mass spectrometric signal for the conditions listed corresponds to 0.5 ppt to 10 ppb.

2.2 A concentration of 0.5 ppt of DMN can be determined in a 150-liter air sample.

3. Interferences

Interferences may result from materials having background ions of m/e 74 ($C_2H_8N_3$, $C_2H_4NO_2$, $C_2H_6N_2O$, C_3H_3Cl, C_3H_6S, $C_3H_6O_2$, or $C_3H_{10}N_2$) if at the same retention time of DMN.

4. Precision and Accuracy

4.1 The precision of this method has been determined to be ±10% of relative standard deviation when replicate sampling cartridges were spiked with 50 ng (corresponding to 10 ppb in 150 ℓ of air). These data were obtained using 10.0 cm long glass tubes (1.5 cm i.d.) packed with 35/50 mesh of Tenax GC (bed dimensions: 1.5 cm x 6 cm in depth).

4.2 The accruacy of the analysis is approximately ±10% of the amount reported as determined from repeated analysis of several standards.

5. Advantages and Disadvantages of the Method

5.1 The gas chromatography-mass spectrometry technique interfaced with a Finnigan glass jet separator (Model 01512-42158 Finnigan Corp., Sunnyvale, CA) is extremely sensitive and specific for the analysis of DMN. The high resolution gas chromatographic separation yields a retention time that is characteristic for DMN, and relatively specific for positive assignment of the signal as DMN. The mass spectrometer in combination with high resolution gas chromatography yields a very high degree of specificity. The base peak of DMN is at m/e 74 which is also the parent ion. In order to assign the signal at m/e 74 to DMN it is absolutely necessary that the retention time matches with the signal.

5.2 Collected samples can be stored upto 1 month with less than 10% losses.

5.3 Because DMN is a suspected carcinogen in man it is extremely important to exercise safety precautions in the preparation and disposal of liquid and gas standards, cleaning of used glassware, etc., and the analysis of air samples.

5.4 Since the mass spectrometer can not be conveniently mobilized, sampling must be carried out away from the instrument.

5.5 High resolution gas chromatography/low resolution mass spectrometry is not a convenient technique for handling a large number of samples.

5.6 Efficiency of air sampling increases as the ambient air temperature decreases (*i.e.* sensitivity increases).

5.7 Ambient air sampling is limited to cases where the NO_x levels are less than 3 ppm when dimethylamine is also present.

APPENDIX A-3. CALCULATIONS FOR UNREGULATED EMISSIONS

This appendices documents the calculational methods used for the unregulated emissions. All values not defined (i.e., CVS FLOW, VOL, etc.) are obtained from the computer printouts for the regulated emissions. Example printout is included as Table 1.

A. Individual Hydrocarbons, Nickel Carbonyl, N_2O and H_2S

1. For FTP Evaluations only, convert 2-Bag UDDS to Equivalent 1-Bag UDDS

$$\text{PPM 12} = \frac{\text{PPM}_1 \times \text{CVS FLOW}_1 + \text{PPM}_2 \times \text{CVS FLOW}_2}{\text{CVS FLOW}_1 + \text{CVS FLOW}_2}$$

$$\text{PPM 34} = \frac{\text{PPM}_3 \times \text{CVS FLOW}_3 + \text{PPM}_4 \times \text{CVS FLOW}_4}{\text{CVS FLOW}_3 + \text{PPM FLOW}_4}$$

2. Convert PPM to $\mu g/m^3$:

$$\mu g/m^3 = 35.32 \times \text{DENSITY} \times \text{PPM}$$

Density, g/ft^3

Methane CH_4	- 18.86	Propane C_3H_8	- 17.29
Ethylene C_2H_4	- 16.50	Propylene C_3H_6	- 16.50
Ethane C_2H_6	- 17.68	Benzene C_6H_6	- 15.33
Acetylene C_2H_2	- 15.33	Toluene C_7H_8	- 15.49
H_2S	- 40.12	N_2O	- 51.82
NH_3	- 20.05	$Ni(CO)_4$	- 200.99

B. Calculation of mg/km

$$\text{mg/km} = ((\text{EXH} \times \text{SCF} - \text{BG} \times \text{DFC}) \times \text{VOL} \div \text{KM}) \div 1000$$

- Calculations were performed using a Hewlett Packard HP-65 Programmable Calculator
- Dry (DFC) and (SCF) was used for all unregulated emissions except: IHC, N_2O and Ni $(CO)_4$
- DFC and SCF are obtained from the computer print-out for regulated emissions. (See Tables 1 and 2.)

C. Metals and Other Elements

COMPONENT WEIGHT ON FILTER = $\mu g/cm^2$ × EFF. FILTER AREA

EFF. FILTER AREA = 14.3 cm^2

COMPONENT $\mu g/m^3$ = C.W.O.F. ÷ TOTAL WT. × ($\mu g/m^3$ for Total Wt.)

APPENDIX A-3 (CONT'D). CALCULATIONS FOR UNREGULATED EMISSIONS

D. Calculation of Average Temperature and Oxygen

$$\text{Average} = \frac{\text{INTEGRATOR COUNTS}}{6.944 \times \text{SECONDS}} \times \text{FULL SCALE VALUE}$$

$$= \text{\% For Oxygen}$$

$$= \text{MV for Catalyst Temperature}$$

E. Calculation For 4-FTP

$$\text{Composite 4-FTP} = 0.43 \times (\text{Value for 1\&2}) + 0.57 \times (\text{Value for 3\&4})$$

APPENDIX A-3 (CONT'D). CALCULATIONS FOR UNREGULATED EMISSIONS

TABLE 1. COMPUTER PRINTOUT NOMENCLATURE FOR FOUR-BAG FTP

```
                              PVM -       FTP  VEHICLE EMISSIONS RESULTS - MALFUNCTION CONDITION
                                                PROJECT

TEST NO.            RUN                          VEHICLE NO.                                  TEST WEIGHT        KG(         LBS)
VEHICLE MODEL                                    DATE                                         ACTUAL ROAD LOAD        KW(        HP)
ENGINE      L(     CID)                          BAG CART NO.                                 GASOLINE  EM-
TRANSMISSION A3                                  DYNO NO.                                     ODOMETER         KM(          MILES)
GVW        KG(         LBS)                      CVS NO.

BAROMETER          MM HG(         IN HG)         DRY BULB TEMP.       DEG C(      DEG F)
RELATIVE HUMIDITY     PCT                        ABS. HUMIDITY       GM/KG                    NOX HUMIDITY CORRECTION FACTOR
BAG RESULTS
   BAG NUMBER                                          1                   2                   3                    4
   DESCRIPTION                                  COLD TRANSIENT        STABILIZED         HOT TRANSIENT          STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)
   BLOWER INLET P MM. H2O(IN. H2O)
   BLOWER INLET TEMP. DEG. C(DEG. F)
   BLOWER REVOLUTIONS
   CVS FLOW STD. CU. METRES(SCF)
   HC  SAMPLE METER/RANGE/PPM
   HC  BCKGRD METER/RANGE/PPM
   CO  SAMPLE METER/RANGE/PPM
   CO  BCKGRD METER/RANGE/PPM
   CO2 SAMPLE METER/RANGE/PCT
   CO2 BCKGRD METER/RANGE/PCT
   NOX SAMPLE METER/RANGE/PPM
   NOX BCKGRD METER/RANGE/PPM
   DILUTION FACTOR

   HC  CONCENTRATION PPM
   CO  CONCENTRATION PPM
   CO2 CONCENTRATION PCT
   NOX CONCENTRATION PPM
   HC  MASS GRAMS
   CO  MASS GRAMS
   CO2 MASS GRAMS
   NOX MASS GRAMS

   HC  GRAMS/KM
   CO  GRAMS/KM
   CO2 GRAMS/KM
   NOX GRAMS/KM
   FUEL CONSUMPTION BY CB L/100KM

   RUN TIME               SECONDS
   AVG. EXH. OXYGEN       PERCENT
   CATALYST AVG. TEMP.    DEG. C
   CATALYST MAX. TEMP.    DEG. C
   MEASURED DISTANCE      KM
        DFC, WET (DRY)
        SCF, WET (DRY)
        VOL (SCM)
        KM  (MEASURED)

COMPOSITE RESULTS                                                                                          3-BAG        (4-BAG)
   TEST NUMBER                          TOTAL FUEL SULFUR    MG/KM           CARBON DIOXIDE       G/KM                  (        )
   BAROMETER     MM HG                  AVG. EXH. OXYGEN     PCT             FUEL CONSUMPTION     L/100KM               (        )
   HUMIDITY      G/KG                   CATALYST AVG. TEMP. DEG C            HYDROCARBONS (THC)  G/KM                   (        )
   TEMPERATURE  DEG C                   CATALYST MAX. TEMP. DEG C            CARBON MONOXIDE      G/KM                  (        )
                                                                             OXIDES OF NITROGEN  G/KM                   (        )
```

APPENDIX A-3 (CONT'D). CALCULATION FOR UNREGULATED EMISSIONS
TABLE 2. DEFINITION OF COMPUTER PRINTOUT NOMENCLATURE

FOR FOUR-BAG AND SINGLE-BAG

REGULATED EMISSIONS

The following are primarily exerpts taken from the computer program:

AVG. EXH. OXYGEN: Direct printout of an input

CATALYST AVG. AND MAX. TEMPS.: Input converted to °C and printed-out

```
C    DFC = DILUTION FACTOR CORRECTION  DFC = FOR WET SAMPLES  DFCD = FOR DRY

     DF(J)=13.4/(  YC2(2,J) +(( YH(2,J) + CC(2,J))/10000.))
     DFC(J) = 1 - 1/DF(J)

C    CALCULATE DFC, VOL. KM FOR BAGS 1+2 AND 3+4
C    DF = TOTAL CVS FLOW / EXHAUST FLOW = AIR + EXH / EXH
C    DFC = 1 - 1/DF = 1 - EXH/(AIR+EXH) = AIR/(AIR+EXH)
     DFC12 =(DFC(1)*VMIX(1) + DFC(2)*VMIX(2)) / (VMIX(1) + VMIX(2))
     DFC34 = (DFC(3)*VMIX(3) + DFC(4)*VMIX(4)) / (VMIX(3) + VMIX(4))
     IF(RH.LT.20) RH = 20
     DFCD12 = DFC12 * (1.0 - 0.000323*(RH - 20))
     DFCD34 = DFC34 * (1.0 - 0.000323*(RH - 20))

C    SCF = SAMPLE CORRECTION FACTOR FOR WATER REMOVAL   SCF = FOR WET  SCFD=DRY
     SCF12 = 1.000
     SCF34 = 1.000
     SCFD12 = (SCFD(1)*VMIX(1)+SCFD(2)+VMIX(2)) / (VMIX(1) + VMIX(2))
     SCFD34 = (SCFD(3)*VMIX(3)+SCFD(4)*VMIX(4)) / (VMIX(3) + VMIX(4))
```

TOTAL FUEL SULFUR:

```
C    TFS = TOTAL FUEL SULFUR IN MG/KM
C    TFS = L/100KM * PCT  * G/ML * 1000ML/L * 0.01G/GPCT * 1000MG/G

     TFS = CBFM   * FSWPCT * FPPG * 100.

C    CALCULATE 4-BAG EMISSIONS AND FUEL CONSUMPTION
C    4-BAG = 0.43*(BAG1+BAG2)/(MILES1+MILES2)+0.57*(BAG3+BAG4)/(MILES3+MILES4)

     DISTA=MILES(1) + MILES(2)
     DISTB=MILES(2) + MILES(3)
     DISTC=MILES(3) + MILES(4)

     HCWM4 = 0.43*((HCM(1)+HCM(2)) / DISTA) + 0.57*((HCM(3)+HCM(4)) / DISTC)
     COWM4 = 0.43*((COM(1)+COM(2)) / DISTA) + 0.57*((COM(3)+COM(4)) / DISTC)
     CO2WM4= 0.43*((CO2M(1)+CO2M(2))/DISTA) + 0.57*((CO2M(3)+CO2M(4)) / DISTC)
     NOXWM4= 0.43*((NOXM(1)+NOXM(2))/DISTA) + 0.57*((NOXM(3)+NOXM(4)) / DISTC)
     CBFE4 = 2421. / (.866*HCWM4 + .429*COWM4 + .273*CO2WM4)
```

APPENDIX B

TASK 1 MALFUNCTION SCREENING EVALUATIONS

TABLE B-1	Summary of the Results
TABLES B-2 through B-5	Individual Sample Results
TABLES B-6 through B-19	Computer Print-Outs

Notes:
1. A double dash (--) means no valid data were available.
2. Measured values were 0.00 mg/km for all spaces left blank for Other Elements.

TABLE B-1. SUMMARY OF THE TASK 1 COMPOSITE FTP RESULTS IN MG/KM (EXCEPT AS NOTED)

	Baseline			Rich Best Idle	No EGR	Ignition Timing		Dirty Air Filter	Misfire	
						5° Ret	8° Adv		7%	12%
Test Number, PVMT-R	10A1-1	10A1-2	10A1-3	10B1	10C1	10D1	10D2	10E1	10F1	10F2
Barometer, mm, Hg	741.7	735.1	742.4	735.6	740.9	743.5	739.1	731.8	734.1	735.6
Humidity, g/kg	10.4	12.2	8.8	11.2	8.0	9.7	11.6	12.0	7.5	9.4
Temperature, °C	25.6	23.3	24.4	23.9	23.3	23.9	22.8	23.9	21.7	23.3
Total Fuel Sulfur, mg/km	33.81	33.47	33.14	34.39	29.55	34.24	30.91	31.79	32.85	34.02
Avg. Exh. Oxygen, %	--	--	6.55	3.60	5.15	4.20	4.25	4.05	3.75	3.80
Catalyst Avg. Temp., °C	--	--	--	--	--	401	374	390	433	469
Catalyst Max. Temp., °C	--	--	423	418	423	474	448	466	524	572
Carbon Dioxide, g/km	352.2	347.8	346.1	304.4	308.0	355.5	322.4	330.1	337.4	345.6
Fuel Cons., ℓ/100 km	15.35	15.20	15.05	15.62	13.42	15.55	14.04	14.43	14.92	15.45
Regulated Emissions										
Hydrocarbons g/km	0.33	0.31	0.29	2.09	0.32	0.29	0.32	0.35	1.31	2.01
Carbon Monoxide g/km	4.12	4.72	3.56	34.95	3.41	5.02	3.52	4.42	5.04	6.38
Oxides of Nitrogen g/km	0.82	0.80	0.75	0.59	2.20	0.62	1.08	0.68	0.79	0.92
Particulates										
Total Particulates	15.89	15.83	7.14	22.55	9.96	7.15	7.35	5.04	6.76	7.26
Sulfate	0.21	0.17	0.11	0.25	0.10	0.19	0.16	0.10	0.18	0.33
Sulfate as % of TFS, %	0.61	0.51	0.32	0.72	0.34	0.55	0.52	0.30	0.55	0.97
Compound Group Totals										
Aldehydes and Ketones	13.8	1.7	--	10.9	6.5	4.9	2.2	--	9.9	18.4
Individual Hydrocarbons	124.3	148.6	138.5	1141.9	144.0	150.2	139.3	155.1	240.0	228.8
Organic Sulfides	0.14	0.07	0.00	--	--	--	0.25	0.46	0.25	0.11
Organic Amines	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Other Compounds										
Ammonia	2.10	1.32	--	9.25	0.62	0.74	0.72	2.97	1.32	5.05
Cyanide and Cyanogen	0.24	0.58	--	2.27	0.98	0.43	0.65	0.80	0.31	0.34
DMNA	--	--	--	--	--	--	--	--	--	--
Hydrogen Sulfide	0.00	0.00	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00
Nickel Carbonyl	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrous Oxide	--	12.81	9.67	24.66	29.35	8.29	12.39	9.40	10.58	11.57

TABLE B-1 (Cont'd). SUMMARY OF THE TASK 1 COMPOSITE FTP RESULTS IN MG/KM (EXCEPT AS NOTED)

	Baseline			Rich Best Idle	No EGR	Ignition Timing		Dirty Air Filter	Misfire	
						5° Ret	8° Adv		7%	12%
Test Number, PVMT-R	10A1-1	10A1-2	10A1-3	10B1	10C1	10D1	10D2	10E1	10F1	10F2
Aldehydes and Ketones										
Formaldehyde	3.26	1.41	--	4.62	6.01	1.76	1.20	--	3.11	3.52
Acetaldehyde	1.65	0.00	--	5.43	0.00	0.00	0.64	--	3.16	3.40
Acetone	6.00	0.00	--	0.00	0.00	0.00	0.00	--	2.69	4.40
Isobutyraldehyde	1.88	0.05	--	0.78	0.00	2.99	0.10	--	0.21	0.00
Methyl Ethyl Ketone	0.71	0.00	--	0.05	0.00	0.09	0.12	--	0.54	7.02
Crotonaldehyde	--	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.28	0.19	--	0.06	0.46	0.09	0.15	--	0.14	0.06
Benzaldehyde	--	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	13.8	1.7	--	10.9	6.5	4.9	2.2	--	9.9	18.4
Total as % of THC, %	4.2	0.5	--	0.5	2.0	1.7	0.7	--	0.8	0.9
Individual Hydrocarbons										
Methane	39.88	54.02	50.08	326.2	46.29	61.24	55.99	59.64	58.24	41.70
Ethylene	25.46	29.71	25.66	388.5	21.90	27.25	24.41	28.35	29.93	33.81
Ethane	11.88	16.67	16.49	43.73	11.29	12.02	14.70	13.67	12.53	11.40
Acetylene	5.01	5.98	5.50	8.41	6.40	6.27	5.98	5.13	8.72	2.73
Propane	1.45	1.99	1.56	2.97	0.36	1.40	0.46	1.12	0.76	1.29
Propylene	11.88	13.96	12.56	104.32	11.04	11.85	11.28	14.26	17.72	22.00
Benzene	8.96	12.10	9.41	102.61	13.23	12.05	10.43	12.27	26.71	33.08
Toluene	19.77	14.13	17.24	165.13	33.47	18.10	16.00	20.61	85.37	82.77
Total Individual HC	124.3	148.6	138.5	1141.9	144.0	150.2	139.3	155.1	240.0	228.8
Total as % of THC, %	37.6	47.9	47.8	54.6	45.0	51.8	43.5	44.3	18.3	11.4
Organic Sulfides										
Carbonyl Sulfide	0.14	0.07	0.00	--	--	--	0.00	0.46	0.11	0.07
Methyl Sulfide	0.00	0.00	0.00	--	--	--	0.00	0.00	0.00	0.00
Ethyl Sulfide	0.00	0.00	0.00	--	--	--	0.14	0.00	0.14	0.04
Methyl Disulfide	0.00	0.00	0.00	--	--	--	0.11	0.00	0.00	0.00
Organic Amines										
Monomethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Monoethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Trace
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE B-1 (Cont'd.) SUMMARY OF THE TASK 1 COMPOSITE FTP RESULTS IN MG/KM (EXCEPT AS NOTED)

		Baseline			Rich Best Idle	No EGR	Ignition Timing		Air Filter	Misfire	
							5° Ret	8° Adv		7%	12%
Test Number, PVMT-R		10A1-1	10A1-2	10A1-3	10B1	10C1	10D1	10D2	10E1	10F1	10F2
Other Elements											
Chromium	Cr					No Data for this test					
Lead	Pb										
Manganese	Mn	0.05	0.05	0.05			0.05	0.09		0.02	0.03
Arsenic	As										
Mercury	Hg										
Bromine	Br										
Phosphorus	P	0.01	0.01		0.01			0.01			
Silicon	Si										
Cadmium	Cd										
Aluminum	Al	0.01	0.01	0.01			0.03	0.02		0.02	0.04
Sulfur	S	0.05	0.04	0.04	0.02		0.04	0.03	0.01	0.04	0.06
Sodium	Na										
Fluorine	F										
Magnesium	Mg	0.01									
Potassium	K										
Chlorine	Cl										0.02
Platinum	Pt										
Zinc	Zn							0.04			
Copper	Cu							0.05			
Nickel	Ni										
Iron	Fe	0.20		0.03			0.14	0.20	0.02	0.29	0.37
Vanadium	V										
Titanium	Ti										
Barium	Ba										
Calcium	Ca										

TABLE B-2. FTP INDIVIDUAL SAMPLE EMISSIONS RESULTS - TASK 1

Test Series 10A1 - Baseline

	Test 10A1 - Run 1		Test 10A1 - Run 2		Test 10A1 - Run 3	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	27.96	6.78	27.94	6.69	13.56	2.30
Sulfates	0.23	0.19	0.20	0.15	0.10	0.11
Ammonia	2.38	1.89	1.62	1.09	--	4.38
Cyanides & Cyanogen	0.51	0.03	1.07	0.21	--	0.06
Hydrogen Sulfide	0	0	0	0	0	0
Aldehydes & Ketones						
Formaldehyde	5.20	1.80	3.28	0	--	0.08
Acetaldehyde	2.20	1.23	0	0	--	0
Acetone	0	10.52	0	0	--	0
Isobutyraldehyde	0.58	2.86	0	0.09	--	0
Methyl ethyl ketone	1.66	0	0	0	--	0
Crotonaldehyde	19.38	17.29	0.56	1.04	--	0
Hexanaldehyde	0.29	0.28	0.21	0.18	--	0
Benzaldehyde	15.96	7.48	4.91	1.46	--	0
Organic Sulfides						
Carbonyl sulfide	0.083	0	0.054	0	--	0
Methyl sulfide	0	0	0	0	--	0
Ethyl sulfide	0	0	0	0	--	0
Methyl disulfide	0	0	0	0	--	0
Organic Amines						
Monomethylamine	0	0	0	0	0	0
Monoethylamine & dimethylamine	0	0	0	0	0	0
Trimethylamine	0	0	0	0	0	0
Diethylamine	0	0	0	0	0	0
Triethylamine	0	0	0	0	0	0

	Run 1 Emissions in ppm				Run 2 Emissions in ppm				Run 3 Emissions in ppm			
	COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS	
	1	2	3	4	1	2	3	4	1	2	3	4
Individual Hydrocarbons												
Methane	9.09	2.77	0.06	2.81	9.78	2.47	4.32	3.65	10.30	2.37	3.93	2.52
Ethylene	13.87	0.45	0.21	0.41	14.22	0.46	2.17	0.27	13.56	0.27	0.95	0.26
Ethane	2.48	1.12	0	1.11	2.53	1.12	1.98	1.17	2.43	1.06	1.95	1.11
Acetylene	3.37	0	0	0	3.99	0	0	0	3.69	0	0	0
Propane	0.27	0.16	0.05	0.12	0.19	0.21	0.17	0.18	0.19	0	0.15	0.24
Propylene	7.32	0	0.05	0	7.55	0.08	0.70	0.03	7.20	0	0.27	0.10
Benzene	5.63	0.19	0	0	5.72	0.66	0.95	0	4.64	0.19	0.33	0.37
Toluene	14.69	0	0	0	8.35	0	1.19	0	7.98	0.07	0.56	0.86
Other												
Nitrous Oxide	0.48	0.18	--	0.08	0.62	0.28	0.73	0.13	0.51	0.19	0.52	0.07
Nickel Carbonyl	--	--	--	--	0	0	0	0	0	0	0	0

TABLE B-3. FTP INDIVIDUAL SAMPLE EMISSIONS RESULTS - TASK 1
Test Series 10D - Ignition Timing

	Test 10D1 - 5° Ignition Retard		Test 10D2 - 8° Ignition Advance	
	COLD-UDDS	HOT-UDDS	COLD UDDS	HOT-UDDS
Total Particulate	12.93	2.79	21.56	3.42
Sulfates	0.206	0.18	0.19	0.13
Ammonia	0	1.30	1.12	0.42
Cyanides & Cyanogen	0.95	0.03	1.02	0.37
Hydrogen Sulfide	0	0	0	0
Aldehydes & Ketones				
Formaldehyde	4.02	0.06	2.80	0
Acetaldehyde	0	0	0.99	0.37
Acetone	0	0	0	0
Isobutyraldehyde	0	5.25	0.23	0
Methyl ethyl ketone	0.21	0	0.11	0.12
Crotonaldehyde	0	52.69	4.85	1.59
Hexanaldehyde	0.09	0.09	0.07	0.21
Benzaldehyde	2.04	0.98	2.90	0.64
Organic Sulfides				
Carbonyl sulfide	0	--	0.01	0
Methyl sulfide	0	--	0	0
Ethyl sulfide	0	--	0.09	0
Methyl disulfide	0	--	0	0.05
Organic Amines				
Monomethylamine	0	0	0	0
Monoethylamine & dimethylamine	0	0	0	0
Trimethylamine	0	0	0	0
Diethylamine	0	0	0	0
Triethylamine	0	0	0	0

	Test 10D1 Emissions in ppm				Test 10D2 Emissions in ppm			
	COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS	
	1	2	3	4	1	2	3	4
Individual Hydrocarbons								
Methane	9.96	3.73	6.04	3.32	9.80	3.79	4.27	3.26
Ethylene	12.34	0.33	2.46	0.35	13.78	0.25	0.63	0.16
Ethane	2.03	0.74	1.55	0.73	2.42	0.98	1.72	0.99
Acetylene	4.17	0	0.02	0	4.05	0	0	0
Propane	0.19	0.01	0.18	0.17	0.20	0.04	0.01	0
Propylene	6.16	0.02	0.87	0.02	7.11	0.01	0	0
Benzene	4.72	0.73	1.26	0.19	5.55	0.58	0.38	0
Toluene	6.94	1.18	1.63	0.20	8.48	9.90	0.59	0
Other								
Nitrous Oxide	0.47	0.19	0.30	0.12	0.74	0.27	0.60	0.14
Nickel Carbonyl	0	0	0	0	0	0	0	0

TABLE B-4. FTP INDIVIDUAL SAMPLE EMISSIONS RESULTS - TASK 1
Test Series 10F - Ignition Misfire

	Test 10F1 - 7% Misfire		Test 10F2 - 12% Misfire	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	13.35	1.79	12.66	3.18
Sulfates	0.21	0.15	0.40	0.27
Ammonia	1.07	1.51	6.09	4.26
Cyanides & Cyanogen	6.39	0.12	0.73	0.05
Hydrogen Sulfide	0	0	0	0
Aldehydes & Ketones				
Formaldehyde	6.40	0.63	7.00	0.89
Acetaldehyde	4.93	1.83	5.67	1.68
Acetone	1.52	3.57	8.93	0.99
Isobutyraldehyde	0.49	0	0	0
Methyl ethyl ketone	0.48	0.58	12.43	2.93
Crotonaldehyde	4.07	0.56	0.90	0.18
Hexanaldehyde	0.14	0.14	0.14	0
Benzaldehyde	5.45	0.95	2.87	0
Organic Sulfides				
Carbonyl sulfide	0.06	0	0.05	0
Methyl sulfide	0	0	0	0
Ethyl sulfide	0.10	0	0.03	0
Methyl disulfide	0	0	0	0
Organic Amines				
Monomethylamine	0	0	0	0
Monoethylamine & dimethylamine	0	0	0.06	0
Trimethylamine	0	0	0	0
Diethylamine	0	0	0	0
Triethylamine	0	0	0	0

	Emissions in ppm				Emissions in ppm			
	COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS	
	1	2	3	4	1	2	3	4
Individual Hydrocarbons								
Methane	12.47	2.62	4.32	1.94	9.39	1.97	4.77	0.97
Ethylene	16.65	0.34	0.92	0.13	16.89	0.44	2.15	0.29
Ethane	2.78	0.68	1.61	0.55	3.04	0.46	1.42	0.42
Acetylene	5.89	0	0	0	1.84	0	0	0
Propane	0.33	0.01	0.08	0	0.38	0	0.21	0.05
Propylene	10.37	0.17	0.33	0	11.54	0.31	1.14	0.08
Benzene	12.73	1.61	1.36	0.30	14.45	0.69	4.26	0.35
Toluene	43.49	4.26	2.55	1.07	42.50	1.22	7.19	0
Other								
Nitrous Oxide	0.42	0.26	0.52	0.16	0.66	0.22	0.53	0.17
Nickel Carbonyl	0	0	0	0	0	0	0	0

TABLE B-5. FTP INDIVIDUAL SAMPLE EMISSIONS RESULTS - TASK 1
Tests 10B1, 10C1 and 10E1 - Various Configurations

	Test 10B1 - Rich Best Idle		Test 10C1 - No EGR		Test 10E1 - Dirty Air Filter	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	27.66	18.70	20.01	2.38	10.3	1.07
Sulfates	0.217	0.274	0.15	0.07	0.13	0.07
Ammonia	6.75	11.13	1.45	0	2.74	3.15
Cyanides & Cyanogen	3.00	1.72	2.06	0.16	1.28	0.43
Hydrogen Sulfide	0.412	0.363	0	0	0	0
Aldehydes & Ketones						
Formaldehyde	6.14	3.48	8.08	4.45	--	0.07
Acetaldehyde	8.21	3.33	0	0	--	0
Acetone	0	0	0	0	--	0.07
Isobutyraldehyde	0.714	0.824	0	0	--	1.38
Methyl ethyl ketone	0.105	0	0	0	--	0
Crotonaldehyde	4.90	5.42	0.17	0	--	7.78
Hexanaldehyde	0.13	0	0	0.80	--	0.26
Benzaldehyde	6.29	3.72	6.34	0.77	--	1.11
Organic Sulfides						
Carbonyl sulfide	--	--	--	--	0.31	0
Methyl sulfide	--	--	--	--	0	0
Ethyl sulfide	--	--	--	--	0	0
Methyl disulfide	--	--	--	--	0	0
Organic Amines						
Monomethylamine	0	0	0	0	0	0
Monoethylamine & dimethylamine	0	0	0	0	0	0
Trimethylamine	0	0	0	0	0	0
Diethylamine	0	0	0	0	0	0
Triethylamine	0	0	0	0	0	0

	Emissions in ppm				Emissions in ppm				Emissions in ppm			
	COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS	
	1	2	3	4	1	2	3	4	1	2	3	4
Individual Hydrocarbons												
Methane	30.17	32.49	26.94	24.13	8.89	2.83	3.85	2.34	9.31	3.84	5.28	3.79
Ethylene	44.59	44.74	40.79	30.93	11.90	0.19	0.90	0.08	14.37	0.25	2.06	0.23
Ethane	4.98	3.82	5.56	3.06	1.93	0.78	1.33	0.68	2.34	0.80	1.76	0.89
Acetylene	5.31	0.01	0.22	0	4.29	0	0	0	3.51	0	0	0
Propane	0.17	0.26	0.42	0.19	0.16	0	0.06	0	0.29	0.14	0	0
Propylene	15.95	10.37	11.35	7.59	6.39	0	0.34	0	7.78	0	0.98	0
Benzene	13.73	11.69	11.11	9.40	5.57	0.93	0.69	0.32	6.09	0.02	1.00	0.35
Toluene	29.00	18.21	15.81	12.91	12.67	2.44	1.93	1.13	11.38	0	0.63	0.79
Other												
Nitrous Oxide	0.56	0.55	1.32	0.72	1.53	0.70	1.69	0.30	0.71	0.22	0.20	0.15
Nickel Carbonyl	0	0	0	0	0	0	0	0	0	0	0	0

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                    PVM - 10A   FTP  VEHICLE EMISSIONS RESULTS - TASK 1 BASELINE REG.
                                     PROJECT 11-4771-001

TEST NO.   10A0      RUN   1                 VEHICLE NO.     10                    TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL    78 OLDS. CUTLASS            DATE     4/ 4/78                      ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                    BAG CART NO.  1                       GASOLINE  EM-268-F
TRANSMISSION A3                              DYNO NO.      3                       ODOMETER  21308 KM( 13240 MILES)
GVW  2046 KG(  4510 LBS)                     CVS NO.       2

BAROMETER 743.71 MM HG(29.28 IN HG)          DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)
RELATIVE HUMIDITY 63 PCT                     ABS. HUMIDITY 12.3 GM/KG               NOX HUMIDITY CORRECTION FACTOR  1.06
BAG RESULTS
   BAG NUMBER                                      1                 2                  3                  4
   DESCRIPTION                              COLD TRANSIENT      STABILIZED        HOT TRANSIENT        STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)             749.3 (29.5)       762.0 (30.0)      762.0 (30.0)       762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)           749.3 (29.5)       749.3 (29.5)      762.0 (30.0)       762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)          43.9 (111.0)       43.9 (111.0)      41.7 (107.0)       43.3 (110.0)
   BLOWER REVOLUTIONS                            40791              69593             40516              69483
   CVS FLOW STD. CU. METRES(SCF)             76.2 (2690.9)     129.9 (4587.3)     75.8 (2677.4)     129.6 (4577.8)
   HC   SAMPLE METER/RANGE/PPM               14.1/ 3/  141      20.1/ 2/   20     34.6/ 2/   35      24.8/ 2/   25
   HC   BCKGRD METER/RANGE/PPM                 .9/ 3/    9      11.9/ 2/   12     18.1/ 2/   18      20.1/ 2/   20
   CO   SAMPLE METER/RANGE/PPM               92.5/ 3/ 1020      34.4/13/   33     82.5/13/   82       2.0/13/    2
   CO   BCKGRD METER/RANGE/PPM                 .1/ 3/    2       2.2/13/    2      1.7/13/    2       1.8/13/    2
   CO2  SAMPLE METER/RANGE/PCT               82.1/ 3/ 1.51      57.9/ 3/ 1.02     68.1/ 3/ 1.23      56.4/ 3/  .99
   CO2  BCKGRD METER/RANGE/PCT                3.3/ 3/  .05       3.3/ 3/  .05      4.2/ 3/  .06       4.2/ 3/  .06
   NOX  SAMPLE METER/RANGE/PPM               46.6/ 2/   47      16.7/ 2/   17     32.2/ 2/   32      17.9/ 2/   18
   NOX  BCKGRD METER/RANGE/PPM                1.0/ 2/    1       1.1/ 2/    1      1.1/ 2/    1       1.0/ 2/    1
   DILUTION FACTOR                               8.25              13.05             10.83              13.47

   HC   CONCENTRATION PPM                         133                 9                18                  6
   CO   CONCENTRATION PPM                         968                29                77                  0
   CO2  CONCENTRATION PCT                        1.47               .97              1.17                .93
   NOX  CONCENTRATION PPM                        45.7              15.7              31.2               17.0
   HC   MASS GRAMS                               5.85               .68               .79                .46
   CO   MASS GRAMS                              85.83              4.43              6.80                .04
   CO2  MASS GRAMS                             2049.0            2318.3            1620.1             2212.3
   NOX  MASS GRAMS                               7.03              4.11              4.77               4.44

   HC   GRAMS/KM                                 1.00               .11               .14                .08
   CO   GRAMS/KM                                14.75               .72              1.18                .01
   CO2  GRAMS/KM                                352.1             377.1             281.3              360.6
   NOX  GRAMS/KM                                 1.21               .67               .83                .72
   FUEL CONSUMPTION BY CB L/100KM               16.15             16.16             12.10              15.40

   RUN TIME               SECONDS                 507               867               505                866
   AVG. EXH. OXYGEN       PERCENT                0.00              0.00              0.00               0.00
   CATALYST AVG. TEMP.    DEG. C                   -                 -                 -                  -
   CATALYST MAX. TEMP.    DEG. C                   -                 -                 -                  -
   MEASURED DISTANCE      KM                     5.82              6.15              5.76               6.14
        DFC, WET (DRY)                                  .907 ( .894)                           .919 ( .906)
        SCF, WET (DRY)                                 1.000 ( .975)                          1.000 ( .976)
        VOL (SCM)                                              206.0                                  205.4
        KM  (MEASURED)                                         11.97                                  11.90

COMPOSITE RESULTS                                                                                 3-BAG        (4-BAG)
   TEST NUMBER   PVMT  10A0           TOTAL FUEL SULFUR   MG/KM   33.11     CARBON DIOXIDE       G/KM      345.4       ( 340.6)
   BAROMETER     MM HG  743.7         AVG. EXH. OXYGEN    PCT      0.00     FUEL CONSUMPTION     L/100KM   15.04       ( 14.81)
   HUMIDITY      G/KG    12.3         CATALYST AVG. TEMP. DEG C     -       HYDROCARBONS (THC)   G/KM        .31       (   .29)
   TEMPERATURE   DEG C   24.4         CATALYST MAX. TEMP. DEG C     -       CARBON MONOXIDE      G/KM       3.78       (  3.57)
                                                                            OXIDES OF NITROGEN   G/KM        .83       (   .84)
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                                PVM - 10A   FTP  VEHICLE EMISSIONS RESULTS - TASK 1 BASELINE REG.
                                                 PROJECT 11-4771-001

TEST NO.   10A0      RUN   2                 VEHICLE NO.     10                    TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 OLDS. CUTLASS             DATE    4/ 5/78                       ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                    BAG CART NO. 1                        GASOLINE  EM-268-F
TRANSMISSION A3                              DYNO NO.     3                        ODOMETER  21343 KM( 13262 MILES)
GVW  2046 KG( 4510 LBS)                      CVS NO.      2

BAROMETER 741.43 MM HG(29.19 IN HG)          DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)
RELATIVE HUMIDITY 59 PCT                     ABS. HUMIDITY 11.1 GM/KG              NOX HUMIDITY CORRECTION FACTOR  1.01
BAG RESULTS
   BAG NUMBER                                      1                   2                   3                    4
   DESCRIPTION                               COLD TRANSIENT        STABILIZED        HOT TRANSIENT          STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)              736.6 (29.0)       749.3 (29.5)       762.0 (30.0)         762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)            736.6 (29.0)       749.3 (29.5)       762.0 (30.0)         762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)           43.9 (111.0)       42.8 (109.0)       43.3 (110.0)         42.8 (109.0)
   BLOWER REVOLUTIONS                            40836              69765              40561                69368
   CVS FLOW STD. CU. METRES(SCF)              76.1 (2689.1)      130.1 (4594.2)     75.4 (2663.6)        129.1 (4559.5)
   HC  SAMPLE METER/RANGE/PPM                 20.8/ 3/  208      20.8/ 2/   21      29.6/ 2/   30        19.1/ 2/   19
   HC  BCKGRD METER/RANGE/PPM                  1.5/ 3/   15      13.5/ 2/   13      13.4/ 2/   13        12.7/ 2/   13
   CO  SAMPLE METER/RANGE/PPM                 50.1/ 3/ 1226      37.9/13/   36      38.9/13/   37         5.2/13/    5
   CO  BCKGRD METER/RANGE/PPM                   .1/ 3/    2       3.4/13/    3       2.9/13/    3         2.5/13/    2
   CO2 SAMPLE METER/RANGE/PCT                 84.6/ 3/ 1.57      59.6/ 3/ 1.06      70.1/ 3/ 1.27        58.5/ 3/ 1.03
   CO2 BCKGRD METER/RANGE/PCT                  4.0/ 3/  .06       4.3/ 3/  .07       4.9/ 3/  .08         4.7/ 3/  .07
   NOX SAMPLE METER/RANGE/PPM                 44.8/ 2/   45      16.6/ 2/   17      32.8/ 2/   33        18.2/ 2/   18
   NOX BCKGRD METER/RANGE/PPM                  1.0/ 2/    1        .8/ 2/    1        .9/ 2/    1          .9/ 2/    1
   DILUTION FACTOR                                7.87              12.64              10.53                12.94

   HC  CONCENTRATION PPM                          195                  8                 17                    7
   CO  CONCENTRATION PPM                         1164                 31                 33                    3
   CO2 CONCENTRATION PCT                         1.51                .99               1.20                  .97
   NOX CONCENTRATION PPM                         43.9               15.9               32.0                 17.4
   HC  MASS GRAMS                                8.56                .63                .76                  .55
   CO  MASS GRAMS                              103.18               4.76               2.87                  .40
   CO2 MASS GRAMS                              2107.8             2364.2             1654.5               2284.9
   NOX MASS GRAMS                                6.48               4.00               4.68                 4.35

   HC  GRAMS/KM                                  1.49                .10                .13                  .09
   CO  GRAMS/KM                                 17.90                .78                .50                  .06
   CO2 GRAMS/KM                                 365.8              387.0              287.9                369.4
   NOX GRAMS/KM                                  1.13                .65                .81                  .70
   FUEL CONSUMPTION BY CB L/100KM               17.01              16.58              12.34                15.78

   RUN TIME                SECONDS                507                868                504                  864
   AVG. EXH. OXYGEN        PERCENT               0.00               0.00               0.00                 0.00
   CATALYST AVG. TEMP.     DEG. C                  -                  -                  -                    -
   CATALYST MAX. TEMP.     DEG. C                  -                  -                  -                    -
   MEASURED DISTANCE       KM                    5.76               6.12               5.75                 6.19
        DFC, WET (DRY)                                   .903 ( .892)                          .916 ( .905)
        SCF, WET (DRY)                                  1.000 ( .976)                         1.000 ( .977)
        VOL (SCM)                                              206.2                                 204.5
        KM  (MEASURED)                                         11.88                                 11.93

COMPOSITE RESULTS                                                                                     3-BAG       (4-BAG)
   TEST NUMBER  PVMT  10AG      TOTAL FUEL SULFUR   MG/KM   34.13      CARBON DIOXIDE        G/KM      355.2      ( 350.2)
   BAROMETER    MM HG  741.4    AVG. EXH. OXYGEN    PCT      0.00      FUEL CONSUMPTION      L/100KM   15.50      ( 15.27)
   HUMIDITY     G/KG    11.1    CATALYST AVG. TEMP. DEG C     -        HYDROCARBONS (THC)    G/KM        .40      (   .40)
   TEMPERATURE  DEG C   23.9    CATALYST MAX. TEMP. DEG C     -        CARBON MONOXIDE       G/KM       4.27      (  4.06)
                                                                       OXIDES OF NITROGEN    G/KM        .80      (   .81)
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                        PVM - 10A   FTP  VEHICLE EMISSIONS RESULTS - TASK 1 BASELINE
                                         PROJECT 11-4771-001
TEST NO.   10A1      RUN   1                    VEHICLE NO.      10                        TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 OLDS. CUTLASS                DATE     4/ 7/78                           ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                       BAG CART NO.  1                            GASOLINE  EM-268-F
TRANSMISSION A3                                 DYNO NO.      3                            ODOMETER  21390 KM( 13291 MILES)
GVW  2046 KG(  4510 LBS)                        CVS NO.       2

BAROMETER 741.68 MM HG(29.20 IN HG)             DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)
RELATIVE HUMIDITY 50 PCT                        ABS. HUMIDITY 10.4 GM/KG
BAG RESULTS                                                                                NOX HUMIDITY CORRECTION FACTOR   .99
   BAG NUMBER                                          1                   2                     3                      4
   DESCRIPTION                                   COLD TRANSIENT        STABILIZED          HOT TRANSIENT            STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)                  749.3 (29.5)        762.0 (30.0)        762.0 (30.0)           762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)                749.3 (29.5)        762.0 (30.0)        762.0 (30.0)           762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)               43.9 (111.0)        42.8 (109.0)        43.3 (110.0)           42.8 (109.0)
   BLOWER REVOLUTIONS                                40697               69691               40682                  70204
   CVS FLOW STD. CU. METRES(SCF)                   75.8 (2676.0)      129.7 (4582.2)       75.7 (2672.6)         130.7 (4616.2)
   HC  SAMPLE METER/RANGE/PPM                    15.7/ 3/  157       30.5/ 2/   30       39.9/ 2/   40          25.7/ 2/   26
   HC  BCKGRD METER/RANGE/PPM                     2.1/ 3/   21       22.4/ 2/   22       21.0/ 2/   21          19.3/ 2/   19
   CO  SAMPLE METER/RANGE/PPM                    49.3/ 3/ 1204       33.1/13/   31       35.3/13/   33           7.1/13/    7
   CO  BCKGRD METER/RANGE/PPM                      .3/ 3/    7        3.7/13/    4        7.7/13/    7           6.6/13/    6
   CO2 SAMPLE METER/RANGE/PCT                    80.2/ 3/ 1.47       58.3/ 3/ 1.03       72.5/ 3/ 1.32          56.0/ 3/  .98
   CO2 BCKGRD METER/RANGE/PCT                     4.2/ 3/  .06        3.7/ 3/  .06        3.6/ 3/  .06           3.1/ 3/  .05
   NOX SAMPLE METER/RANGE/PPM                    43.1/ 2/   43       17.5/ 2/   18       37.6/ 2/   38          19.4/ 2/   19
   NOX BCKGRD METER/RANGE/PPM                     1.1/ 2/    1         .9/ 2/    1        1.1/ 2/    1           1.0/ 2/    1
   DILUTION FACTOR                                    8.35               12.94               10.13                  13.57

   HC  CONCENTRATION PPM                              139                  10                  21                      8
   CO  CONCENTRATION PPM                             1144                  27                  25                      1
   CO2 CONCENTRATION PCT                             1.42                 .98                1.27                    .94
   NOX CONCENTRATION PPM                             42.1                16.7                36.6                   18.5
   HC  MASS GRAMS                                    6.05                 .74                 .92                    .59
   CO  MASS GRAMS                                  100.96                4.06                2.24                    .12
   CO2 MASS GRAMS                                  1966.2              2321.0              1753.6                 2249.8
   NOX MASS GRAMS                                    6.04                4.09                5.24                   4.57

   HC  GRAMS/KM                                      1.05                 .12                 .16                    .10
   CO  GRAMS/KM                                     17.58                 .67                 .39                    .02
   CO2 GRAMS/KM                                     342.4               381.3               305.6                  365.2
   NOX GRAMS/KM                                      1.05                 .67                 .91                    .74
   FUEL CONSUMPTION BY CB L/100KM                   15.44               16.34               13.09                  15.63

   RUN TIME              SECONDS                     506                 868                 506                    874
   AVG. EXH. OXYGEN      PERCENT                      -                   -                   -                      -
   CATALYST AVG. TEMP.   DEG. C                       -                   -                   -                      -
   CATALYST MAX. TEMP.   DEG. C                       -                   -                   -                      -
   MEASURED DISTANCE     KM                          5.74                6.09                5.74                   6.16
        DFC, WET (DRY)                                        .907 ( .898)                            .917 ( .908)
        SCF, WET (DRY)                                       1.000 ( .979)                           1.000 ( .980)
        VOL (SCM)                                                  205.5                                   206.4
        KM  (MEASURED)                                             11.83                                   11.90
COMPOSITE RESULTS
   TEST NUMBER  PVMT  10A1        TOTAL FUEL SULFUR   MG/KM   33.81                                   3-BAG        (4-BAG)
   BAROMETER    MM HG  741.7      AVG. EXH. OXYGEN    PCT       -       CARBON DIOXIDE       G/KM     352.2      ( 347.6)
   HUMIDITY     G/KG    10.4      CATALYST AVG. TEMP. DEG C     -       FUEL CONSUMPTION     L/100KM  15.35      ( 15.14)
   TEMPERATURE  DEG C   25.6      CATALYST MAX. TEMP. DEG C     -       HYDROCARBONS (THC)   G/KM       .33      (   .32)
                                                                        CARBON MONOXIDE      G/KM      4.12      (  3.93)
                                                                        OXIDES OF NITROGEN   G/KM       .82      (   .84)
                        PVM - 10A   FTP  VEHICLE EMISSIONS RESULTS - TASK 1 BASELINE
                                         PROJECT 11-4771-001

TEST NO.   10A1     RUN   2                    VEHICLE NO.     10              TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 OLDS. CUTLASS               DATE     4/10/78                ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                      BAG CART NO.  1                 GASOLINE  EM-268-F
TRANSMISSION A3                                DYNO NO.      3                 ODOMETER  21440 KM( 13322 MILES)
GVW  2046 KG(  4510 LBS)                       CVS NO.       2

BAROMETER 735.08 MM HG(28.94 IN HG)            DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)
RELATIVE HUMIDITY 66 PCT                       ABS. HUMIDITY 12.2 GM/KG        NOX HUMIDITY CORRECTION FACTOR  1.05
BAG RESULTS
   BAG NUMBER                                       1                 2                 3                  4
   DESCRIPTION                                COLD TRANSIENT     STABILIZED      HOT TRANSIENT       STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)              736.6 (29.0)      762.0 (30.0)     762.0 (30.0)       749.3 (29.5)
   BLOWER INLET P MM. H2O(IN. H2O)            736.6 (29.0)      762.0 (30.0)     762.0 (30.0)       749.3 (29.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)           43.9 (111.0)      43.3 (110.0)     42.2 (108.0)       41.7 (107.0)
   BLOWER REVOLUTIONS                             40759             69658            40686              69535
   CVS FLOW STD. CU. METRES(SCF)               75.3 (2658.7)    128.3 (4530.7)    75.1 (2651.6)     128.7 (4544.7)
   HC  SAMPLE METER/RANGE/PPM                 14.9/ 3/  149     19.0/ 2/   19     32.6/ 2/   33      17.0/ 2/   17
   HC  BCKGRD METER/RANGE/PPM                  1.4/ 3/   14     11.8/ 2/   12     11.9/ 2/   12      11.1/ 2/   11
   CO  SAMPLE METER/RANGE/PPM                 52.5/ 3/ 1293     51.6/13/   49     52.6/13/   50       2.3/13/    2
   CO  BCKGRD METER/RANGE/PPM                   .1/ 3/    2      1.6/13/    2      1.6/13/    2        .6/13/    1
   CO2 SAMPLE METER/RANGE/PCT                 82.3/ 3/ 1.52     58.1/ 3/ 1.03     71.6/ 3/ 1.30      57.2/ 3/ 1.01
   CO2 BCKGRD METER/RANGE/PCT                  4.5/ 3/  .07      4.6/ 3/  .07      4.1/ 3/  .06       3.5/ 3/  .05
   NOX SAMPLE METER/RANGE/PPM                 43.1/ 2/   43     16.3/ 2/   16     32.2/ 2/   32      17.7/ 2/   18
   NOX BCKGRD METER/RANGE/PPM                  1.0/ 2/    1       .9/ 2/    1       .9/ 2/    1        .8/ 2/    1
   DILUTION FACTOR                                8.10             12.99            10.27              13.27

   HC  CONCENTRATION PPM                           137                8               22                  7
   CO  CONCENTRATION PPM                          1226               46               47                  2
   CO2 CONCENTRATION PCT                          1.46              .96             1.24                .96
   NOX CONCENTRATION PPM                          42.2             15.5             31.4               17.0
   HC  MASS GRAMS                                 5.94              .60              .95                .50
   CO  MASS GRAMS                               107.45             6.84             4.07                .24
   CO2 MASS GRAMS                               2008.3           2255.2           1704.8             2257.3
   NOX MASS GRAMS                                 6.40             3.99             4.74               4.39

   HC  GRAMS/KM                                   1.04              .10              .16                .08
   CO  GRAMS/KM                                  18.87             1.14              .70                .04
   CO2 GRAMS/KM                                  352.6            374.3            295.4              373.8
   NOX GRAMS/KM                                   1.12              .66              .82                .73
   FUEL CONSUMPTION BY CB L/100KM                16.46            16.06            12.68              15.97

   RUN TIME              SECONDS                   506              867              506                865
   AVG. EXH. OXYGEN      PERCENT                     -                -                -                  -
   CATALYST AVG. TEMP.   DEG. C                      -                -                -                  -
   CATALYST MAX. TEMP.   DEG. C                      -                -                -                  -
   MEASURED DISTANCE     KM                       5.70             6.03             5.77               6.04
         DFC, WET (DRY)                                  .906 ( .892)                       .917 ( .903)
         SCF, WET (DRY)                                 1.000 ( .974)                      1.000 ( .975)
         VOL (SCM)                                              203.6                              203.7
         KM  (MEASURED)                                         11.72                              11.81
                                                                                                  3-BAG        (4-BAG)
COMPOSITE RESULTS                                                           CARBON DIOXIDE       G/KM     347.8        ( 347.7)
   TEST NUMBER   PVMT  10A1          TOTAL FUEL SULFUR   MG/KM   33.47      FUEL CONSUMPTION     L/100KM  15.20        ( 15.18)
   BAROMETER     MM HG  735.1        AVG. EXH. OXYGEN    PCT       -        HYDROCARBONS (THC)   G/KM       .31        (   .31)
   HUMIDITY      G/KG    12.2        CATALYS1 AVG. TEMP. DEG C     -        CARBON MONOXIDE      G/KM      4.72        (  4.90)
   TEMPERATURE   DEG C   23.3        CATALYST MAX. TEMP. DEG C     -        OXIDES OF NITROGEN   G/KM       .80        (   .82)
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                    PVM - 10A   FTP  VEHICLE EMISSIONS RESULTS - TASK 1 BASELINE
                                      PROJECT 11-4771-001

TEST NO.   10A1      RUN   3                VEHICLE NO.     10                    TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 OLDS. CUTLASS            DATE    4/14/78                       ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                   BAG CART NO.  1                       GASOLINE  EM-268-F
TRANSMISSION A3                             DYNO NO.      3                       ODOMETER  21509 KM( 13365 MILES)
GVW  2096 KG(  4510 LBS)                    CVS NO.       2

BAROMETER 742.44 MM HG(29.23 IN HG)         DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)
RELATIVE HUMIDITY 45 PCT                    ABS. HUMIDITY  8.8 GM/KG              NOX HUMIDITY CORRECTION FACTUR   .94
BAG RESULTS
   BAG NUMBER                                     1                     2                     3                     4
   DESCRIPTION                              COLD TRANSIENT          STABILIZED          HOT TRANSIENT          STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)             762.0 (30.0)          774.7 (30.5)          762.0 (30.0)          762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)           762.0 (30.0)          762.0 (30.0)          762.0 (30.0)          762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)          43.3 (110.0)          43.9 (111.0)          43.3 (110.0)          43.3 (110.0)
   BLOWER REVOLUTIONS                            40638                 69560                 40610                 69498
   CVS FLOW STD. CU. METRES(SCF)              76.2 (2691.4)        130.2 (4599.8)         76.1 (2689.4)        130.3 (4602.1)
   HC  SAMPLE METER/RANGE/PPM               14.0/ 3/  140         17.9/ 2/   18         28.7/ 2/   29         21.4/ 2/   21
   HC  BCKGRD METER/RANGE/PPM                1.2/ 3/   12         11.7/ 2/   12         12.4/ 2/   12         21.4/ 2/   21
   CO  SAMPLE METER/RANGE/PPM               44.2/ 3/ 1065         20.5/13/   20         22.3/13/   21          5.3/13/    5
   CO  BCKGRD METER/RANGE/PPM                 .1/ 3/    2          2.1/13/    2          3.5/13/    3          5.3/13/    5
   CO2 SAMPLE METER/RANGE/PCT               80.9/ 3/ 1.49         56.2/ 3/  .99         69.2/ 3/ 1.25         50.7/ 3/  .88
   CO2 BCKGRD METER/RANGE/PCT                3.8/ 3/  .06          3.0/ 3/  .05          3.1/ 3/  .05          3.1/ 3/  .05
   NOX SAMPLE METER/RANGE/PPM               45.0/ 2/   45         17.4/ 2/   17         29.6/ 2/   30         16.0/ 2/   16
   NOX BCKGRD METER/RANGE/PPM                 .6/ 2/    1           .6/ 2/    1           .7/ 2/    1           .7/ 2/    1
   DILUTION FACTOR                               8.35                 13.51                 10.70                 15.17

   HC  CONCENTRATION PPM                          129                     7                    17                     1
   CO  CONCENTRATION PPM                         1017                    17                    17                     0
   CO2 CONCENTRATION PCT                         1.44                   .95                  1.20                   .84
   NOX CONCENTRATION PPM                         44.5                  16.8                  29.0                  15.3
   HC  MASS GRAMS                                5.69                   .53                   .77                   .11
   CO  MASS GRAMS                               90.26                  2.57                  1.54                   .04
   CO2 MASS GRAMS                              2005.4                2254.6                1680.2                1995.6
   NOX MASS GRAMS                                6.10                  3.95                  3.97                  3.60

   HC  GRAMS/KM                                  1.00                   .09                   .14                   .02
   CO  GRAMS/KM                                 15.82                   .42                   .28                   .01
   CO2 GRAMS/KM                                 351.5                 365.6                 303.8                 337.3
   NOX GRAMS/KM                                  1.07                   .64                   .72                   .61
   FUEL CONSUMPTION BY CB L/100KM               16.20                 15.65                 13.01                 14.40

   RUN TIME               SECONDS                 505                   867                   505                   866
   AVG. EXH. OXYGEN       PERCENT                1.16                  1.34                  1.34                  1.41
   CATALYST AVG. TEMP.    DEG. C                   -                     -                     -                     -
   CATALYST MAX. TEMP.    DEG. C                  376                   423                   423                   427
   MEASURED DISTANCE      KM                     5.71                  6.17                  5.53                  5.92
        DFC, WET (DRY)                                    .909 ( .902)                                .924 ( .916)
        SCF, WET (DRY)                                   1.000 ( .981)                               1.000 ( .983)
        VOL (SCM)                                               206.4                                       206.4
        KM  (MEASURED)                                          11.87                                       11.45
COMPOSITE RESULTS
   TEST NUMBER   PVMT  10A1          TOTAL FUEL SULFUR    MG/KM   33.14                                     3-BAG         (4-BAG)
   BAROMETER     MM HG  742.4        AVG. EXH. OXYGEN     PCT      1.31       CARBON DIOXIDE       G/KM      346.1        ( 337.3)
   HUMIDITY      G/KG     8.8        CATALYST AVG. TEMP. DEG C      -         FUEL CONSUMPTION     L/100KM   15.05        ( 14.67)
   TEMPERATURE   DEG C   24.4        CATALYST MAX. TEMP. DEG C     423        HYDROCARBONS (THC)   G/KM        .29        (    .27)
                                                                              CARBON MONOXIDE      G/KM       3.56        (  3.44)
                                                                              OXIDES OF NITROGEN   G/KM        .75        (    .74)
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                     PVM - 108   FTP  VEHICLE EMISSIONS RESULTS - TSK 1 RICH BEST IDLE
                                      PROJECT 11-4771-001

TEST NO.   1081     RUN   1                  VEHICLE NO.      10                   TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 OLDS. CUTLASS             DATE    4/17/78                       ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                    BAG CART NO.  1                       GASOLINE  EM-268-F
TRANSMISSION A3                              DYNO NO.      3                       ODOMETER  21543 KM( 13386 MILES)
GVW  2046 KG(  4510 LBS)                     CVS NO.       2

BAROMETER 735.58 MM HG(28.96 IN HG)          DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)
RELATIVE HUMIDITY 59 PCT                     ABS. HUMIDITY 11.2 GM/KG              NOX HUMIDITY CORRECTION FACTOR  1.02
BAG RESULTS
   BAG NUMBER                                    1                2                  3                 4
   DESCRIPTION                            COLD TRANSIENT     STABILIZED        HOT TRANSIENT      STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)           736.6 (29.0)     762.0 (30.0)      762.0 (30.0)      762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)         736.6 (29.0)     762.0 (30.0)      762.0 (30.0)      762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)        42.8 (109.0)     42.8 (109.0)      43.3 (110.0)      43.3 (110.0)
   BLOWER REVOLUTIONS                          40647            69535             40630             69478
   CVS FLOW STD. CU. METRES(SCF)            75.8 (2677.0)   129.2 (4562.2)     75.4 (2663.3)    128.9 (4553.7)
   HC  SAMPLE METER/RANGE/PPM              31.9/ 3/  319    21.9/ 3/  219     20.2/ 3/  202     16.6/ 3/  166
   HC  BCKGRD METER/RANGE/PPM               1.9/ 3/   19     2.2/ 3/   22      2.3/ 3/   23      2.2/ 3/   22
   CO  SAMPLE METER/RANGE/PPM              85.7/ 3/ 2368    71.2/ 3/ 1861     53.8/ 3/ 1330     58.7/ 3/ 1472
   CO  BCKGRD METER/RANGE/PPM                .2/ 3/    5      .4/ 3/    9       .5/ 3/   11       .4/ 3/    9
   CO2 SAMPLE METER/RANGE/PCT              78.4/ 3/ 1.44    50.3/ 3/  .87     63.2/ 3/ 1.13     48.3/ 3/  .83
   CO2 BCKGRD METER/RANGE/PCT               3.5/ 3/  .05     3.4/ 3/  .05      2.9/ 3/  .04      4.6/ 3/  .07
   NOX SAMPLE METER/RANGE/PPM              41.0/ 2/   41    11.0/ 2/   11     23.9/ 2/   24     12.0/ 2/   12
   NOX BCKGRD METER/RANGE/PPM               1.0/ 2/    1      .9/ 2/    1       .9/ 2/    1      1.3/ 2/    1
   DILUTION FACTOR                              7.91            12.47             10.51             13.49

   HC  CONCENTRATION PPM                        302              199               181               146
   CO  CONCENTRATION PPM                       2253             1786              1266              1412
   CO2 CONCENTRATION PCT                       1.39              .82              1.09              .[illegible]7
   NOX CONCENTRATION PPM                       40.1             10.2              23.0              10.8
   HC  MASS GRAMS                             13.22            14.81              7.88             10.83
   CO  MASS GRAMS                            198.90           268.65            111.15            212.05
   CO2 MASS GRAMS                            1929.0           1951.5            1500.6            1815.6
   NOX MASS GRAMS                              5.92             2.56              3.37              2.71

   HC  GRAMS/KM                                2.28             2.40              1.37              1.75
   CO  GRAMS/KM                               34.31            43.58             19.26             34.17
   CO2 GRAMS/KM                               332.8            316.6             260.1             292.6
   NOX GRAMS/KM                                1.02              .41               .58               .44
   FUEL CONSUMPTION BY CB L/100KM             16.81            16.76             12.58             15.02

   RUN TIME              SECONDS                505              866               506               866
   AVG. EXH. OXYGEN      PERCENT                .66              .74               .74               .72
   CATALYST AVG. TEMP.   DEG. C                  -                -                 -                 -
   CATALYST MAX. TEMP.   DEG. C                 376              418               418               427
   MEASURED DISTANCE     KM                    5.80             6.16              5.77              6.21
        DFC, WET (DRY)                             .903 ( .891)                       .918 ( .907)
        SCF, WET (DRY)                            1.000 ( .977)                      1.000 ( .979)
        VOL (SCM)                                        205.0                             204.3
        KM  (MEASURED)                                   11.96                             11.97

COMPOSITE RESULTS                                                                                  3-BAG       (4-BAG)
   TEST NUMBER  PVMT  1081       TOTAL FUEL SULFUR   MG/KM   34.39     CARBON DIOXIDE       G/KM      304.4       ( 297.4)
   BAROMETER    MM HG  735.6     AVG. EXH. OXYGEN    PCT       .72     FUEL CONSUMPTION     L/100KM   15.62       ( 15.11)
   HUMIDITY     G/KG    11.2     CATALYST AVG. TEMP. DEG C      -      HYDROCARBONS (THC)   G/KM       2.09       (  1.90)
   TEMPERATURE  DEG C   23.9     CATALYST MAX. TEMP. DEG C     418     CARBON MONOXIDE      G/KM      34.95       ( 32.19)
                                                                       OXIDES OF NITROGEN   G/KM        .59       (   .59)
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                              PVM - 10C   FTP  VEHICLE EMISSIONS RESULTS - TASK 1 PLUGGED EGR
                                                PROJECT 11-4771-001
 TEST NO.   10C1      RUN   1                         VEHICLE NO.      10                       TEST WEIGHT   1588 KG(  3500 LBS)
 VEHICLE MODEL    78 OLDS. CUTLASS                    DATE     4/19/78                          ACTUAL ROAD LOAD    8.0 KW( 10.7 HP)
 ENGINE 5.0 L(305 CID) V-8                            BAG CART NO.  1                           GASOLINE  EM-268-F
 TRANSMISSION A3                                      DYNO NO.      3                           ODOMETER  21615 KM( 13431 MILES)
 GVW  2046 KG(  4510 LBS)                             CVS NO.       2

 BAROMETER 740.92 MM HG(29.17 IN HG)                  DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)
 RELATIVE HUMIDITY 44 PCT                             ABS. HUMIDITY  8.0 GM/KG
 BAG RESULTS                                                                                    NOX HUMIDITY CORRECTION FACTOR   .92
    BAG NUMBER                                        1                       2                        3                        4
    DESCRIPTION                                COLD TRANSIENT            STABILIZED             HOT TRANSIENT            STABILIZED

    BLOWER DIF P MM. H2O(IN. H2O)              736.6 (29.0)            762.0 (30.0)            762.0 (30.0)            762.0 (30.0)
    BLOWER INLET P MM. H2O(IN. H2O)            736.6 (29.0)            762.0 (30.0)            762.0 (30.0)            762.0 (30.0)
    BLOWER INLET TEMP. DEG. C(DEG. F)           43.3 (110.0)            43.3 (110.0)            43.3 (110.0)            43.3 (110.0)
    BLOWER REVOLUTIONS                            40606                   69559                   40548                   69567
    CVS FLOW STD. CU. METRES(SCF)              76.2 (2692.4)          130.1 (4595.6)           75.9 (2679.1)          130.1 (4596.1)
    HC  SAMPLE METER/RANGE/PPM                15.2/ 3/  152           15.5/ 2/   15           26.6/ 2/   27           13.6/ 2/   14
    HC  BCKGRD METER/RANGE/PPM                  .9/ 3/    9            8.2/ 2/    8            8.2/ 2/    8            7.7/ 2/    8
    CO  SAMPLE METER/RANGE/PPM                41.3/ 3/  988           24.9/13/   24           28.0/13/   27            4.7/13/    5
    CO  BCKGRD METER/RANGE/PPM                  .1/ 3/    2            2.5/13/    2            1.2/13/    1            1.4/13/    1
    CO2 SAMPLE METER/RANGE/PCT                75.8/ 3/ 1.38           51.3/ 3/  .89           61.8/ 3/ 1.10           47.1/ 3/  .81
    CO2 BCKGRD METER/RANGE/PCT                 3.8/ 3/  .06            3.0/ 3/  .05            3.6/ 3/  .06            3.1/ 3/  .05
    NOX SAMPLE METER/RANGE/PPM                40.4/ 3/  121           49.6/ 2/   50           35.4/ 3/  106           45.9/ 2/   46
    NOX BCKGRD METER/RANGE/PPM                  .4/ 3/    1             .7/ 2/    1             .3/ 3/    1             .7/ 2/    1
    DILUTION FACTOR                                8.98                   14.95                   12.14                   16.48

    HC  CONCENTRATION PPM                           144                      8                      19                       6
    CO  CONCENTRATION PPM                           946                     21                      25                       3
    CO2 CONCENTRATION PCT                          1.33                    .85                    1.05                     .77
    NOX CONCENTRATION PPM                         120.1                   48.9                   105.4                    45.2
    HC  MASS GRAMS                                 6.33                    .59                     .83                     .48
    CO  MASS GRAMS                                84.01                   3.12                    2.17                     .48
    CO2 MASS GRAMS                               1858.6                 2024.0                  1456.0                  1827.7
    NOX MASS GRAMS                                16.07                  11.18                   14.03                   10.33

    HC  GRAMS/KM                                   1.10                    .10                     .14                     .08
    CO  GRAMS/KM                                  14.57                    .51                     .38                     .08
    CO2 GRAMS/KM                                  322.3                  332.1                   252.6                   299.6
    NOX GRAMS/KM                                   2.79                   1.83                    2.43                    1.69
    FUEL CONSUMPTION BY CB L/100KM                14.88                  14.22                   10.82                   12.80

    RUN TIME                SECONDS                 505                    867                     505                     867
    AVG. EXH. OXYGEN        PERCENT                 .90                   1.07                    1.03                    1.07
    CATALYST AVG. TEMP.     DEG. C                  -                      -                       -                       -
    CATALYST MAX. TEMP.     DEG. C                  363                    423                     410                     423
    MEASURED DISTANCE       KM                     5.77                   6.09                    5.76                    6.10
         DFC, WET (DRY)                                  .917 ( .910)                                    .931 ( .924)
         SCF, WET (DRY)                                 1.000 ( .982)                                   1.000 ( .984)
         VOL (SCM)                                              206.4                                           206.0
         KM  (MEASURED)                                         11.86                                           11.87
         .
 COMPOSITE RESULTS
    TEST NUMBER   PVMT  10C1            TOTAL FUEL SULFUR    MG/KM    29.55                                         3-BAG        (4-BAG)
    BAROMETER     MM HG  740.9          AVG. EXH. OXYGEN     PCT       1.03        CARBON DIOXIDE       G/KM        308.0       ( 298.5)
    HUMIDITY      G/KG     8.0          CATALYST AVG. TEMP.  DEG C      -          FUEL CONSUMPTION     L/100KM     13.42       ( 13.00)
    TEMPERATURE   DEG C   23.3          CATALYST MAX. TEMP.  DEG C     423         HYDROCARBONS (THC)   G/KM          .32       (   .31)
                                                                                   CARBON MONOXIDE      G/KM         3.41       (  3.29)
                                                                                   OXIDES OF NITROGEN   G/KM         2.20       (  2.16)
                              PVM - 10A   FTP  VEHICLE EMISSIONS RESULTS - TASK 1 BASELINE REG.
                                                PROJECT 11-4771-001

TEST NO.   10A0     RUN   3                          VEHICLE NO.     10                 TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 OLDS. CUTLASS                     DATE    4/20/78                    ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                            BAG CART NO.  1                    GASOLINE  EM-268-F
TRANSMISSION A3                                      DYNO NO.      3                    ODOMETER  21651 KM( 13453 MILES)
GVW  2046 KG(  4510 LBS)                             CVS NO.       2

BAROMETER 742.44 MM HG(29.23 IN HG)                  DRY BULB TEMP. 22.8 DEG C(73.0 DEG F)
RELATIVE HUMIDITY 36 PCT                             ABS. HUMIDITY  6.3 GM/KG           NOX HUMIDITY CORRECTION FACTOR   .87
BAG RESULTS
   BAG NUMBER                                              1                 2                  3                   4
   DESCRIPTION                                      COLD TRANSIENT      STABILIZED       HOT TRANSIENT         STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)                    762.0 (30.0)      762.0 (30.0)      762.0 (30.0)       762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)                  762.0 (30.0)      762.0 (30.0)      762.0 (30.0)       762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)                 43.3 (110.0)      43.9 (111.0)      43.9 (111.0)       43.3 (110.0)
   BLOWER REVOLUTIONS                                  40600             69574             40563              69610
   CVS FLOW STD. CU. METRES(SCF)                     76.1 (2688.7)    130.3 (4602.8)     76.0 (2683.6)     130.5 (4609.5)
   HC  SAMPLE METER/RANGE/PPM                       17.3/ 3/  173     16.6/ 2/   17     26.0/ 2/   26      15.0/ 2/   15
   HC  BCKGRD METER/RANGE/PPM                         .8/ 3/    8      8.0/ 2/    8      8.8/ 2/    9       8.8/ 2/    9
   CO  SAMPLE METER/RANGE/PPM                       49.7/ 3/ 1215     33.6/13/   32     69.9/13/   68      11.3/13/   11
   CO  BCKGRD METER/RANGE/PPM                         .1/ 3/    2      3.8/13/    4      2.8/13/    3       2.6/13/    3
   CO2 SAMPLE METER/RANGE/PCT                       80.3/ 3/ 1.48     56.8/ 3/ 1.00     66.3/ 3/ 1.19      52.3/ 3/  .91
   CO2 BCKGRD METER/RANGE/PCT                        2.4/ 3/  .04      2.7/ 3/  .04      3.2/ 3/  .05       3.5/ 3/  .05
   NOX SAMPLE METER/RANGE/PPM                       54.4/ 2/   54     19.6/ 2/   20     35.6/ 2/   36      19.6/ 2/   20
   NOX BCKGRD METER/RANGE/PPM                         .9/ 2/    1       .8/ 2/    1       .9/ 2/    1        .4/ 2/    1
   DILUTION FACTOR                                        8.32             13.34             11.18              14.66

   HC  CONCENTRATION PPM                               166                 9                18                  7
   CO  CONCENTRATION PPM                              1164                27                63                  8
   CO2 CONCENTRATION PCT                              1.44               .96              1.14                .86
   NOX CONCENTRATION PPM                              53.6              18.9              34.8               18.8
   HC  MASS GRAMS                                     7.29               .69               .79                .51
   CO  MASS GRAMS                                   103.20              4.16              5.61               1.22
   CO2 MASS GRAMS                                   2012.6            2294.6            1592.6             2059.4
   NOX MASS GRAMS                                     6.82              4.11              4.42               4.09

   HC  GRAMS/KM                                       1.26               .11               .14                .08
   CO  GRAMS/KM                                      17.90               .68               .97                .20
   CO2 GRAMS/KM                                      349.0             375.9             276.2              336.8
   NOX GRAMS/KM                                       1.18               .67               .77                .67
   FUEL CONSUMPTION BY CB L/100KM                    16.27             16.10             11.87              14.40

   RUN TIME              SECONDS                      505               867               505                868
   AVG. EXH. OXYGEN      PERCENT                      .81               .92               .92               1.01
   CATALYST AVG. TEMP.   DEG. C                        -                 -                 -                  -
   CATALYST MAX. TEMP.   DEG. C                       393               466               444                461
   MEASURED DISTANCE     KM                          5.77              6.10              5.77               6.11
        DFC, WET (DRY)                                        .908 ( .904)                        .924 ( .919)
        SCF, WET (DRY)                                       1.000 ( .984)                       1.000 ( .985)
        VOL (SCM)                                                  206.4                               206.5
        KM  (MEASURED)                                             11.87                               11.88

COMPOSITE RESULTS                                                                                          3-BAG       (4-BAG)
   TEST NUMBER   PVMT  10A0        TOTAL FUEL SULFUR   MG/KM   32.95        CARBON DIOXIDE      G/KM       342.7      ( 331.2)
   BAROMETER     MM HG  742.4      AVG. EXH. OXYGEN    PCT       .90        FUEL CONSUMPTION    L/100KM    14.97      ( 14.47)
   HUMIDITY      G/KG     6.3      CATALYST AVG. TEMP. DEG C      -         HYDROCARBONS (THC)  G/KM         .36      (   .35)
   TEMPERATURE   DEG C   22.8      CATALYST MAX. TEMP. DEG C     466        CARBON MONOXIDE     G/KM        4.36      (  4.22)
                                                                            OXIDES OF NITROGEN  G/KM         .81      (   .80)
                              PVM - 10D   FTP  VEHICLE EMISSIONS RESULTS - TASK 1 RETAND 5 DEG.
                                                PROJECT 11-4771-001
TEST NO.   1001      RUN   1
VEHICLE MODEL   78 OLDS. CUTLASS                VEHICLE NO.      10                           TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 5.0 L(305 CID) V-8                       DATE     4/27/78                              ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
TRANSMISSION A3                                 BAG CART NO.  1                               GASOLINE  EM-268-F
GVW  2046 KG(  4510 LBS)                        DYNO NO.      3                               ODOMETER  21700 KM( 13484 MILES)
                                                CVS NO.       2
BAROMETER 743.96 MM HG(29.27 IN HG)
RELATIVE HUMIDITY 51 PCT                        DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)
BAG RESULTS                                     ABS. HUMIDITY  9.7 GM/KG                      NOX HUMIDITY CORRECTION FACTOR   .97
   BAG NUMBER                                          1                     2                     3                     4
   DESCRIPTION                                  COLD TRANSIENT          STABILIZED          HOT TRANSIENT          STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)                 736.6 (29.0)          762.0 (30.0)          762.0 (30.0)          762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)               736.6 (29.0)          762.0 (30.0)          762.0 (30.0)          762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)              43.9 (111.0)          43.9 (111.0)          43.9 (111.0)          43.9 (111.0)
   BLOWER REVOLUTIONS                               40564                 69643                 40512                 69514
   CVS FLOW STD. CU. METRES(SCF)                  76.4 (2697.7)        130.6 (4614.2)         76.0 (2684.2)        130.4 (4605.6)
   HC   SAMPLE METER/RANGE/PPM                 12.4/ 3/  124         18.1/ 2/   18         39.8/ 2/   40         19.0/ 2/   19
   HC   BCKGRD METER/RANGE/PPM                  1.2/ 3/   12         10.7/ 2/   11         12.0/ 2/   12         12.3/ 2/   12
   CO   SAMPLE METER/RANGE/PPM                 44.5/ 3/ 1073         43.3/13/   41         74.6/11/  328         25.0/13/   24
   CO   BCKGRD METER/RANGE/PPM                   .2/ 3/    5          4.4/13/    4          3.0/11/    9          8.4/13/    8
   CO2  SAMPLE METER/RANGE/PCT                 82.1/ 3/ 1.51         59.7/ 3/ 1.06         72.5/ 3/ 1.32         56.3/ 3/  .99
   CO2  BCKGRD METER/RANGE/PCT                  3.3/ 3/  .05          4.7/ 3/  .07          4.8/ 3/  .07          2.9/ 3/  .04
   NOX  SAMPLE METER/RANGE/PPM                 37.3/ 2/   37         13.5/ 2/   13         26.4/ 2/   26         14.5/ 2/   14
   NOX  BCKGRD METER/RANGE/PPM                   .8/ 2/    1           .6/ 2/    1           .6/ 2/    1           .6/ 2/    1
   DILUTION FACTOR                                   8.23                 12.61                  9.92                 13.48

   HC   CONCENTRATION PPM                             113                     8                    29                     8
   CO   CONCENTRATION PPM                            1020                    36                   306                    15
   CO2  CONCENTRATION PCT                            1.47                   .99                  1.25                   .95
   NOX  CONCENTRATION PPM                            36.6                  12.9                  25.9                  13.9
   HC   MASS GRAMS                                   5.00                   .62                  1.27                   .57
   CO   MASS GRAMS                                  90.74                  5.42                 27.12                  2.35
   CO2  MASS GRAMS                                 2054.6                2369.6                1738.0                2265.6
   NOX  MASS GRAMS                                   5.17                  3.13                  3.64                  3.36

   HC   GRAMS/KM                                      .87                   .10                   .22                   .09
   CO   GRAMS/KM                                    15.71                   .88                  4.69                   .38
   CO2  GRAMS/KM                                    355.7                 384.9                 300.5                 365.1
   NOX  GRAMS/KM                                      .90                   .51                   .63                   .54
   FUEL CONSUMPTION BY CB L/100KM                   16.35                 16.50                 13.17                 15.62

   RUN TIME                SECONDS                    505                   868                   505                   867
   AVG. EXH. OXYGEN        PERCENT                    .76                   .85                   .87                   .94
   CATALYST AVG. TEMP.     DEG. C                     221                   450                   389                   457
   CATALYST MAX. TEMP.     DEG. C                     418                   474                   466                   474
   MEASURED DISTANCE       KM                        5.78                  6.16                  5.78                  6.21
        DFC, WET (DRY)                                         .905 ( .896)                                .916 ( .907)
        SCF, WET (DRY)                                        1.000 ( .979)                               1.000 ( .980)
        VOL (SCM)                                                     207.0                                       206.4
        KM  (MEASURED)                                                11.93                                       11.99
COMPOSITE RESULTS
   TEST NUMBER  PVMT  1001                                                                             3-BAG         (4-BAG)
   BAROMETER    MM HG  743.5       TOTAL FUEL SULFUR   MG/KM   34.24      CARBON DIOXIDE      G/KM      355.5        ( 349.8)
   HUMIDITY     G/KG     9.7       AVG. EXH. OXYGEN    PCT       .84      FUEL CONSUMPTION    L/100KM   15.55        ( 15.29)
   TEMPERATURE  DEG C   23.9       CATALYST AVG. TEMP. DEG C     401      HYDROCARBONS (THC)  G/KM        .29        (   .29)
                                   CATALYST MAX. TEMP. DEG C     474      CARBON MONOXIDE     G/KM       5.02        (  4.87)
                                                                          OXIDES OF NITROGEN  G/KM        .62        (   .63)
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                        PVM - 100   FTP  VEHICLE EMISSIONS RESULTS - TSK 1   DEG. ADVANCE
                                              PROJECT 11-4771-001

TEST NO.   1002     RUN   1                      VEHICLE NO.     10                     TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 OLDS. CUTLASS                 DATE    4/28/78                        ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                        BAG CART NO.  1                        GASOLINE  EM-268-F
TRANSMISSION A3                                  DYNO NO.      3                        ODOMETER  21784 KM( 13536 MILES)
GVW  2096 KG( 4510 LBS)                          CVS NO.       2

BAROMETER 739.14 MM HG(29.10 IN HG)              DRY BULB TEMP. 22.8 DEG C(73.0 DEG F)
RELATIVE HUMIDITY 65 PCT                         ABS. HUMIDITY 11.6 GM/KG               NOX HUMIDITY CORRECTION FACTOR  1.03
BAG RESULTS
   BAG NUMBER                                          1                   2                   3                    4
   DESCRIPTION                                  COLD TRANSIENT        STABILIZED         HOT TRANSIENT          STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)                736.6 (29.0)        762.0 (30.0)        762.0 (30.0)         762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)              736.6 (29.0)        762.0 (30.0)        762.0 (30.0)         762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)             43.9 (111.0)        43.9 (111.0)        43.3 (110.0)         43.9 (111.0)
   BLOWER REVOLUTIONS                              40606               69586               40617                69450
   CVS FLOW STD. CU. METRES(SCF)                76.0 (2683.2)      129.7 (4580.9)      75.8 (2676.6)       129.4 (4571.5)
   HC   SAMPLE METER/RANGE/PPM                  16.7/ 3/  167       18.0/ 2/   18       23.0/ 2/   23        16.6/ 2/   17
   HC   BCKGRD METER/RANGE/PPM                   1.2/ 3/   12       11.1/ 2/   11       10.0/ 2/   10        10.0/ 2/   10
   CO   SAMPLE METER/RANGE/PPM                  45.6/ 3/ 1103       17.7/13/   17        9.8/13/    9         2.7/13/    3
   CO   BCKGRD METER/RANGE/PPM                    .3/ 3/    7        1.6/13/    2        1.7/13/    2         1.7/13/    2
   CO2 SAMPLE METER/RANGE/PCT                   78.3/ 3/ 1.43       54.1/ 3/  .95       64.1/ 3/ 1.14        51.9/ 3/  .90
   CO2 BCKGRD METER/RANGE/PCT                    3.6/ 3/  .06        2.6/ 3/  .04        2.9/ 3/  .04         3.2/ 3/  .05
   NOX SAMPLE METER/RANGE/PPM                   59.4/ 2/   59       22.4/ 2/   22       43.0/ 2/   43        23.5/ 2/   23
   NOX BCKGRD METER/RANGE/PPM                     .8/ 2/    1         .6/ 2/    1         .6/ 2/    1          .5/ 2/    1
   DILUTION FACTOR                                  8.61               14.10               11.67                14.79

   HC   CONCENTRATION PPM                            156                   8                  14                    7
   CO   CONCENTRATION PPM                           1043                  15                   8                    1
   CO2 CONCENTRATION PCT                            1.39                 .91                1.10                  .86
   NOX CONCENTRATION PPM                            58.7                21.8                42.5                 23.0
   HC   MASS GRAMS                                  6.85                 .58                 .61                  .54
   CO   MASS GRAMS                                 92.28                2.24                 .67                  .15
   CO2 MASS GRAMS                                 1927.9              2160.9              1532.6               2034.2
   NOX MASS GRAMS                                   8.80                5.59                6.35                 5.88

   HC   GRAMS/KM                                    1.17                 .09                 .11                  .09
   CO   GRAMS/KM                                   15.81                 .36                 .12                  .03
   CO2 GRAMS/KM                                    330.4               349.2               265.8                333.2
   NOX GRAMS/KM                                     1.51                 .90                1.10                  .96
   FUEL CONSUMPTION BY CB L/100KM                  15.32               14.94               11.37                14.23

   RUN TIME                  SECONDS                 505                 867                 505                  867
   AVG. EXH. OXYGEN          PERCENT                 .70                 .88                 .88                  .94
   CATALYST AVG. TEMP.       DEG. C                  189                 423                 364                  424
   CATALYST MAX. TEMP.       DEG. C                  384                 448                 431                  440
   MEASURED DISTANCE         KM                     5.84                6.19                5.76                 6.11
        DFC, WET (DRY)                                     .912 ( .844)                            .926 ( .912)
        SCF, WET (DRY)                                    1.000 ( .975)                           1.000 ( .976)
        VOL (SCM)                                                205.7                                   205.2
        KM  (MEASURED)                                           12.02                                   11.87

COMPOSITE RESULTS                                                                                        3-BAG         (4-BAG)
   TEST NUMBER   PVMT  1002          TOTAL FUEL SULFUR    MG/KM    30.91        CARBON DIOXIDE       G/KM      322.4        ( 317.5)
   BAROMETER     MM HG  739.1        AVG. EXH. OXYGEN     PCT        .85        FUEL CONSUMPTION     L/100KM    14.04        ( 13.82)
   HUMIDITY      G/KG    11.6        CATALYST AVG. TEMP. DEG C      374        HYDROCARBONS (THC)   G/KM        .32        (   .32)
   TEMPERATURE   DEG C   22.8        CATALYST MAX. TEMP. DEG C      448        CARBON MONOXIDE      G/KM       3.52        (  3.42)
                                                                                OXIDES OF NITROGEN   G/KM       1.08        (  1.10)
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                              PVM - 10E   FTPC VEHICLE EMISSIONS RESULTS - TSK 1 AIR FLOW REST.
                                               PROJECT 11-4771-001

TEST NO.   10E1      RUN   1                           VEHICLE NO.     10                      TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 OLDS. CUTLASS                       DATE     5/ 2/78                        ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                              BAG CART NO.  1                         GASOLINE  EM-268-F
TRANSMISSION A3                                        DYNO NO.      3                         ODOMETER  21836 KM( 13568 MILES)
GVW  2046 KG(  4510 LBS)                               CVS NO.       2

BAROMETER 731.77 MM HG(28.81 IN HG)                    DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)
RELATIVE HUMIDITY 63 PCT                               ABS. HUMIDITY 12.0 GM/KG                NOX HUMIDITY CORRECTION FACTOR  1.05
BAG RESULTS
  BAG NUMBER                                                 1                  2                  3                  4
  DESCRIPTION                                         COLD TRANSIENT       STABILIZED        HOT TRANSIENT        STABILIZED

  BLOWER DIF P MM. H2O(IN. H2O)                        736.6 (29.0)       762.0 (30.0)       762.0 (30.0)       762.0 (30.0)
  BLOWER INLET P MM. H2O(IN. H2O)                      736.6 (29.0)       762.0 (30.0)       762.0 (30.0)       762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)                     43.9 (111.0)       43.3 (110.0)       43.9 (111.0)       43.9 (111.0)
  BLOWER REVOLUTIONS                                      40667              69694              40570              69461
  CVS FLOW STD. CU. METRES(SCF)                         75.2 (2657.8)     128.6 (4541.9)      74.8 (2641.5)     128.0 (4522.3)
  HC   SAMPLE METER/RANGE/PPM                          17.7/ 3/  177      21.0/ 2/   21      38.2/ 2/   38      20.5/ 2/   20
  HC   BCKGRD METER/RANGE/PPM                           1.7/ 3/   17      14.5/ 2/   14      13.3/ 2/   13      13.5/ 2/   13
  CO   SAMPLE METER/RANGE/PPM                          50.9/ 3/ 1248      33.2/13/   31      94.8/13/   96       9.2/13/    9
  CO   BCKGRD METER/RANGE/PPM                            .2/ 3/    5       3.5/13/    3       2.0/13/    2       1.2/13/    1
  CO2  SAMPLE METER/RANGE/PCT                          80.4/ 3/ 1.48      55.8/ 3/  .98      69.1/ 3/ 1.25      54.7/ 3/  .96
  CO2  BCKGRD METER/RANGE/PCT                           3.5/ 3/  .05       4.2/ 3/  .06       3.2/ 3/  .05       3.8/ 3/  .06
  NOX  SAMPLE METER/RANGE/PPM                          37.5/ 2/   37      13.6/ 2/   14      30.5/ 2/   30      15.9/ 2/   16
  NOX  BCKGRD METER/RANGE/PPM                            .9/ 2/    1        .9/ 2/    1        .9/ 2/    1        .9/ 2/    1
  DILUTION FACTOR                                           8.30              13.60              10.64              13.94

  HC   CONCENTRATION PPM                                   162                  8                 26                  8
  CO   CONCENTRATION PPM                                  1103                 27                 90                  7
  CO2  CONCENTRATION PCT                                  1.43                .92               1.20                .90
  NOX  CONCENTRATION PPM                                  36.7               12.8               29.7               15.1
  HC   MASS GRAMS                                         7.03                .56               1.13                .59
  CO   MASS GRAMS                                       103.71               4.05               7.87               1.12
  CO2  MASS GRAMS                                       1971.8             2167.1             1645.6             2120.4
  NOX  MASS GRAMS                                         5.52               3.28               4.44               3.86

  HC   GRAMS/KM                                           1.21                .09                .20                .10
  CO   GRAMS/KM                                          17.82                .65               1.37                .18
  CO2  GRAMS/KM                                          338.9              349.3              287.2              350.6
  NOX  GRAMS/KM                                            .95                .53                .77                .64
  FUEL CONSUMPTION BY CB L/100KM                         15.02              14.97              12.38              14.99

  RUN TIME               SECONDS                           506                868                505                866
  AVG. EXH. OXYGEN       PERCENT                           .65                .85                .83                .89
  CATALYST AVG. TEMP.    DEG. C                            205                439                379                447
  CATALYST MAX. TEMP.    DEG. C                            397                466                448                466
  MEASURED DISTANCE      KM                               5.82               6.20               5.73               6.05
      DFC, WET (DRY)                                             .909 ( .897)                          .920 ( .907)
      SCF, WET (DRY)                                            1.000 ( .976)                         1.000 ( .976)
      VOL (SCM)                                                       203.8                                 202.8
      KM  (MEASURED)                                                  12.02                                 11.78
COMPOSITE RESULTS
   TEST NUMBER  PVMT  10E1            TOTAL FUEL SULFUR    MG/KM    31.79                                   3-BAG        (4-BAG)
   BAROMETER    MM HG  731.8          AVG. EXH. OXYGEN     PCT        .81      CARBON DIOXIDE       G/KM      330.1       ( 330.3)
   HUMIDITY     G/KG    12.0          CATALYST AVG. TEMP.  DEG C      390      FUEL CONSUMPTION     L/100KM   14.43       ( 14.43)
   TEMPERATURE  DEG C   23.9          CATALYST MAX. TEMP.  DEG C      466      HYDROCARBONS (THC)   G/KM        .35       (   .35)
                                                                               CARBON MONOXIDE      G/KM       4.42       (  4.29)
                                                                               OXIDES OF NITROGEN   G/KM        .68       (   .72)
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                       PVM - 10F   FTP  VEHICLE EMISSIONS RESULTS - TSK 1 7 PCT. MISFIRE
                                         PROJECT 11-4771-001

TEST NO.   10F1     RUN   1                   VEHICLE NO.      10                     TEST WEIGHT   1588 KG(  3500 LbS)
VEHICLE MODEL    78 OLDS. CUTLASS             DATE    5/ 3/78                         ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                     BAG CART NO.  1                         GASOLINE  EM-268-F
TRANSMISSION A3                               DYNO NO.      3                         ODOMETER  21871 KM( 13590 MILES)
GVW  2046 KG(  4510 LBS)                      CVS NO.       2

BAROMETER 734.06 MM HG(28.90 IN HG)           DRY BULB TEMP. 21.7 DEG C(71.0 DEG F)
RELATIVE HUMIDITY 45 PCT                      ABS. HUMIDITY  7.5 GM/KG               NOX HUMIDITY CORRECTION FACTOR   .91
BAG RESULTS
   BAG NUMBER                                      1                  2                  3                  4
   DESCRIPTION                               COLD TRANSIENT      STABILIZED        HOT TRANSIENT       STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)              736.6 (29.0)       762.0 (30.0)       762.0 (30.0)       762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)            736.6 (29.0)       762.0 (30.0)       762.0 (30.0)       762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)           43.9 (111.0)       43.3 (110.0)       43.3 (110.0)       43.3 (110.0)
   BLOWER REVOLUTIONS                             40699              69701              40657              69621
   CVS FLOW STD. CU. METRES(SCF)              75.6 (2669.3)     129.1 (4558.5)      75.3 (2659.1)     128.9 (4553.0)
   HC  SAMPLE METER/RANGE/PPM                68.8/ 3/  688      34.1/ 2/   34      67.9/ 2/   68      23.5/ 2/   23
   HC  BCKGRD METER/RANGE/PPM                 1.6/ 3/   16      15.7/ 2/   16      11.3/ 2/   11      10.5/ 2/   10
   CO  SAMPLE METER/RANGE/PPM                56.6/ 3/ 1411      51.7/13/   49      50.4/13/   48       8.8/13/    9
   CO  BCKGRD METER/RANGE/PPM                  .4/ 3/    4       3.4/13/    3       1.7/13/    2       1.3/13/    1
   CO2 SAMPLE METER/RANGE/PCT                79.7/ 3/ 1.46      55.5/ 3/  .97      67.8/ 3/ 1.22      51.5/ 3/  .90
   CO2 BCKGRD METER/RANGE/PCT                 3.7/ 3/  .06       2.2/ 3/  .03       2.8/ 3/  .04       2.4/ 3/  .04
   NOX SAMPLE METER/RANGE/PPM                49.0/ 2/   49      18.7/ 2/   19      35.9/ 2/   36      20.2/ 2/   20
   NOX BCKGRD METER/RANGE/PPM                 1.0/ 2/    1        .8/ 2/    1        .9/ 2/    1       1.0/ 2/    1
   DILUTION FACTOR                                 8.04              13.69              10.89              14.90

   HC  CONCENTRATION PPM                         674                 20                 58                 14
   CO  CONCENTRATION PPM                        1392                 45                 45                  7
   CO2 CONCENTRATION PCT                        1.41                .94               1.18                .86
   NOX CONCENTRATION PPM                        48.1               18.0               35.1               19.3
   HC  MASS GRAMS                              29.38               1.46               2.50               1.02
   CO  MASS GRAMS                             118.14               6.71               3.92               1.06
   CO2 MASS GRAMS                             1956.7             2228.8             1627.8             2034.8
   NOX MASS GRAMS                               6.30               4.01               4.57               4.30

   HC  GRAMS/KM                                 5.13                .24                .44                .17
   CO  GRAMS/KM                                20.61               1.10                .69                .17
   CO2 GRAMS/KM                                341.4              363.9              284.7              331.5
   NOX GRAMS/KM                                 1.10                .66                .80                .70
   FUEL CONSUMPTION BY CB L/100KM              16.65              15.64              12.26              14.18

   RUN TIME              SECONDS                 505                867                505                867
   AVG. EXH. OXYGEN      PERCENT                 .70                .75                .78                .81
   CATALYST AVG. TEMP.   DEG. C                  201                491                437                503
   CATALYST MAX. TEMP.   DEG. C                  444                524                516                533
   MEASURED DISTANCE     KM                     5.73               6.12               5.72               6.14
        DFC, WET (DRY)                                  .908 ( .900)                          .924 ( .916)
        SCF, WET (DRY)                                 1.000 ( .981)                         1.000 ( .982)
        VOL (SCM)                                             204.6                                 204.2
        KM  (MEASURED)                                        11.86                                 11.86
COMPOSITE RESULTS                                                                                        3-BAG       (4-BAG)
   TEST NUMBER  PVMT  10F1         TOTAL FUEL SULFUR   MG/KM   32.85      CARBON DIOXIDE       G/KM      337.4      ( 327.9)
   BAROMETER    MM HG  734.1       AVG. EXH. OXYGEN    PCT       .75      FUEL CONSUMPTION     L/100KM   14.92      ( 14.49)
   HUMIDITY     G/KG     7.5       CATALYST AVG. TEMP. DEG C     433      HYDROCARBONS (THC)   G/KM       1.31      (  1.29)
   TEMPERATURE  DEG C   21.7       CATALYST MAX. TEMP. DEG C     524      CARBON MONOXIDE      G/KM       5.04      (  4.77)
                                                                          OXIDES OF NITROGEN   G/KM        .79      (   .80)
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                               PVM - 10F   FTP  VEHICLE EMISSIONS RESULTS - TSK 1 12 PCT.MISFIRE
                                                PROJECT 11-4771-001

TEST NO.   10F2      RUN   1                      VEHICLE NO.     10                     TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 OLDS. CUTLASS                  DATE    5/ 5/78                        ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                         BAG CART NO.  1                        GASOLINE  EM-268-F
TRANSMISSION A3                                   DYNO NO.      3                        ODOMETER  21911 KM( 13615 MILES)
GVW  2046 KG(  4510 LBS)                          CVS NO.       2

BAROMETER 735.58 MM HG(28.96 IN HG)               DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)
RELATIVE HUMIDITY 51 PCT                          ABS. HUMIDITY  9.4 GM/KG
BAG RESULTS                                                                              NOX HUMIDITY CORRECTION FACTOR   .96
   BAG NUMBER                                            1                 2                    3                    4
   DESCRIPTION                                    COLD TRANSIENT       STABILIZED         HOT TRANSIENT          STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)                  736.6 (29.0)       762.0 (30.0)       762.0 (30.0)         762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)                736.6 (29.0)       762.0 (30.0)       762.0 (30.0)         762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)               44.4 (112.0)       43.9 (111.0)       43.9 (111.0)         43.9 (111.0)
   BLOWER REVOLUTIONS                                 40718              69657              40572                69652
   CVS FLOW STD. CU. METRES(SCF)                   75.7 (2673.4)     129.1 (4561.4)      75.2 (2656.8)       129.1 (4560.8)
   HC   SAMPLE METER/RANGE/PPM                    10.1/ 4/ 1010      38.7/ 2/   39      16.8/ 3/  168        32.2/ 2/   32
   HC   BCKGRD METER/RANGE/PPM                      .3/ 4/   30      19.1/ 2/   19       1.5/ 3/   15        13.9/ 2/   14
   CO   SAMPLE METER/RANGE/PPM                    56.8/ 3/ 1916      56.7/13/   59      80.5/11/  370        51.1/13/   49
   CO   BCKGRD METER/RANGE/PPM                      .5/ 3/   11       4.6/13/    4       1.9/11/    6          .8/13/    1
   CO2  SAMPLE METER/RANGE/PCT                    80.7/ 3/ 1.48      58.1/ 3/ 1.03      71.9/ 3/ 1.30        56.7/ 3/ 1.00
   CO2  BCKGRD METER/RANGE/PCT                     4.7/ 3/  .07       4.7/ 3/  .07       3.9/ 3/  .06         4.5/ 3/  .07
   NOX  SAMPLE METER/RANGE/PPM                    54.2/ 2/   54      21.2/ 2/   21      37.8/ 2/   38        19.7/ 2/   20
   NOX  BCKGRD METER/RANGE/PPM                      .9/ 2/    1        .8/ 2/    1        .7/ 2/    1          .6/ 2/    1
   DILUTION FACTOR                                     7.79              12.95               9.89                 13.33

   HC   CONCENTRATION PPM                              984                 21                155                  19
   CO   CONCENTRATION PPM                             1393                 48                349                  46
   CO2  CONCENTRATION PCT                             1.92                .96               1.25                 .93
   NOX  CONCENTRATION PPM                             53.4               20.5               37.2                19.1
   HC   MASS GRAMS                                   42.96               1.57               6.70                1.44
   CO   MASS GRAMS                                  118.39               7.27              30.59                6.96
   CO2  MASS GRAMS                                  1970.4             2267.1             1720.8              2208.0
   NOX  MASS GRAMS                                    7.91               4.84               5.12                4.53

   HC   GRAMS/KM                                      7.44                .26               1.16                 .24
   CO   GRAMS/KM                                     20.50               1.20               5.30                1.14
   CO2  GRAMS/KM                                     341.2              372.9              298.3               361.2
   NOX  GRAMS/KM                                      1.28                .80                .89                 .74
   FUEL CONSUMPTION BY CB L/100KM                    16.95              16.03              13.25               15.53

   RUN TIME               SECONDS                      506                867                505                 868
   AVG. EXH. OXYGEN       PERCENT                      .84                .79                .79                 .75
   CATALYST AVG: TEMP.    DEG. C                       224                534                454                 551
   CATALYST MAX. TEMP.    DEG. C                       478                572                559                 584
   MEASURED DISTANCE      KM                          5.77               6.08               5.77                6.11
        DFC, WET (DRY)                                       .904 ( .895)              .915 ( .906)
        SCF, WET (DRY)                                      1.000 ( .979)             1.000 ( .980)
        VOL (SCM)                                                  204.8                     204.4
        KM  (MEASURED)                                             11.85                     11.88
COMPOSITE RESULTS
   TEST NUMBER            10F2                                                                          3-BAG        (4-BAG)
   BAROMETER     MM HG  735.6     TOTAL FUEL SULFUR    MG/KM   34.02     CARBON DIOXIDE       G/KM      345.6       ( 342.2)
   HUMIDITY      G/KG     9.4     AVG. EXH. OXYGEN     PCT       .76     FUEL CONSUMPTION     L/100KM   15.45       ( 15.30)
   TEMPERATURE   DEG C   23.3     CATALYST AVG. TEMP. DEG C      469     HYDROCARBONS (THC)   G/KM       2.01       (  2.01)
                                  CATALYST MAX. TEMP. DEG C      572     CARBON MONOXIDE      G/KM       6.38       (  6.36)
                                                                         OXIDES OF NITROGEN   G/KM        .92       (   .91)
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                    PVM - 10A   FTP  VEHICLE EMISSIONS RESULTS - BASELINE ENGINE
                                     PROJECT 11-4771-001

TEST NO.   10A0     RUN   4                VEHICLE NO.     10                       TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 OLDS CUTLASS            DATE    5/ 8/78                          ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                  BAG CART NO.  1                          GASOLINE  EM-268-F
TRANSMISSION A3                            DYNO NO.      3                          ODOMETER  21943 KM( 13635 MILES)
GVW  2046 KG(  4510 LBS)                   CVS NO.       2

BAROMETER 736.85 MM HG(29.01 IN HG)        DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)
RELATIVE HUMIDITY 51 PCT                   ABS. HUMIDITY  9.4 GM/KG                 NOX HUMIDITY CORRECTION FACTOR   .96
BAG RESULTS
  BAG NUMBER                                     1                  2                  3                  4
  DESCRIPTION                              COLD TRANSIENT       STABILIZED        HOT TRANSIENT       STABILIZED

  BLOWER DIF P MM. H2O(IN. H2O)             736.6 (29.0)       762.0 (30.0)       762.0 (30.0)       762.0 (30.0)
  BLOWER INLET P MM. H2O(IN. H2O)           736.6 (29.0)       762.0 (30.0)       762.0 (30.0)       762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)          43.9 (111.0)       43.3 (110.0)       43.3 (110.0)       42.8 (109.0)
  BLOWER REVOLUTIONS                            40665              69647              40590              69538
  CVS FLOW STD. CU. METRES(SCF)              75.8 (2678.2)     129.5 (4574.0)      75.5 (2665.7)     129.4 (4571.0)
  HC  SAMPLE METER/RANGE/PPM                16.6/ 3/  166      20.2/ 2/   20      24.6/ 2/   25      18.9/ 2/   19
  HC  BCKGRD METER/RANGE/PPM                 1.3/ 3/   13      12.0/ 2/   12      10.8/ 2/   11      11.0/ 2/   11
  CO  SAMPLE METER/RANGE/PPM                61.1/ 3/ 1544      46.2/13/   44      45.5/13/   43      16.3/13/   16
  CO  BCKGRD METER/RANGE/PPM                  .1/ 3/    2       4.7/13/    5       2.2/13/    2       1.8/13/    2
  CO2 SAMPLE METER/RANGE/PCT                80.0/ 3/ 1.47      56.9/ 3/ 1.00      67.5/ 3/ 1.21      55.0/ 3/  .96
  CO2 BCKGRD METER/RANGE/PCT                 3.7/ 3/  .06       3.5/ 3/  .05       3.6/ 3/  .06       3.7/ 3/  .06
  NOX SAMPLE METER/RANGE/PPM                40.2/ 2/   40      13.0/ 2/   13      31.2/ 2/   31      14.5/ 2/   14
  NOX BCKGRD METER/RANGE/PPM                 1.0/ 2/    1        .7/ 2/    1        .8/ 2/    1        .8/ 2/    1
  DILUTION FACTOR                                 8.20              13.30              10.98              13.85

  HC  CONCENTRATION PPM                           155                  9                 15                  9
  CO  CONCENTRATION PPM                          1473                 38                 40                 13
  CO2 CONCENTRATION PCT                          1.42                .95               1.16                .91
  NOX CONCENTRATION PPM                          39.3               12.4               30.5               13.8
  HC  MASS GRAMS                                 6.76                .68                .64                .65
  CO  MASS GRAMS                               130.04               5.75               3.48               2.02
  CO2 MASS GRAMS                               1971.7             2257.8             1607.8             2160.7
  NOX MASS GRAMS                                 5.46               2.93               4.21               3.26

  HC  GRAMS/KM                                   1.17                .11                .11                .11
  CO  GRAMS/KM                                  22.54                .94                .61                .33
  CO2 GRAMS/KM                                  341.7              367.3              280.4              351.4
  NOX GRAMS/KM                                    .95                .48                .73                .53
  FUEL CONSUMPTION BY CB L/100KM                16.26              15.76              12.03              15.03

  RUN TIME                 SECONDS                505                867                505                866
  AVG. EXH. OXYGEN         PERCENT                .69                .77                .84                .84
  CATALYST AVG. TEMP.      DEG. C                 214                439                387                446
  CATALYST MAX. TEMP.      DEG. C                 406                457                453                466
  MEASURED DISTANCE        KM                    5.77               6.15               5.73               6.15
       DFC, WET (DRY)                                   .908 ( .899)                          .921 ( .912)
       SCF, WET (DRY)                                  1.000 ( .979)                         1.000 ( .980)
       VOL (SCM)                                             205.3                                 204.9
       KM  (MEASURED)                                        11.92                                 11.88

COMPOSITE RESULTS                                                                                       3-BAG       (4-BAG)
  TEST NUMBER           10A1      TOTAL FUEL SULFUR   MG/KM   32.66     CARBON DIOXIDE      G/KM        330.1      ( 333.4)
  BAROMETER    MM HG   736.9      AVG. EXH. OXYGEN    PCT       .77     FUEL CONSUMPTION    L/100KM     14.83      ( 14.62)
  HUMIDITY     G/KG      9.4      CATALYST AVG. TEMP. DEG C     393     HYDROCARBONS (THC)  G/KM          .33      (   .33)
  TEMPERATURE  DEG C    23.3      CATALYST MAX. TEMP. DEG C     457     CARBON MONOXIDE     G/KM         5.34      (  5.16)
                                                                        OXIDES OF NITROGEN  G/KM          .65      (   .66)
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APPENDIX C

SUMMARIES OF THE RESULTS

	Car	Description
TABLES C-1 through C-4	11	1977 AMC Pacer
TABLES C-5 through C-8	12	1978 Chevrolet Malibu
TABLES C-9 through C-12	13	1978 Chev. Malibu (Calif.)
TABLES C-13 through C-16	14	1978 Ford Granada
TABLES C-17 through C-20	15	1978 Ford Mustang II

Notes: 1. A double dash (--) means no valid data were available.
2. Measured values were 0.00 mg/km for all spaces left blank for Other Elements.

TABLE C-1. CAR 111 - RICH BEST IDLE
1977 AMC PACER - 49 STATE W/O CATALYST

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	111-11	111-12	111-13	111-21	111-22	111-23	111-31	111-32	111-33
Barometer, mm Hg	746.25	742.2	742.2	737.62	736.6	736.6	732.54	732.5	734.1
Humidity, g/kg	9.4	9.3	9.0	8.9	8.8	9.5	10.1	8.9	8.6
Temperature, °C	24.4	23.3	23.9	22.8	26.1	26.1	23.3	26.1	26.7
Total Fuel Sulfur, mg/km	27.95	23.99	21.34	32.41	25.71	22.73	32.12	25.16	22.61
Avg. Exh. Oxygen, %	6.55	5.70	4.90	3.50	4.15	4.65	4.25	4.15	4.80
Catalyst Avg. Temp., °C	--	--	--	--	--	--	--	--	--
Catalyst Max. Temp., °C	--	--	--	--	--	--	--	--	--
Carbon Dioxide, g/km	304.9	269.6	239.8	334.8	283.2	254.3	330.3	276.1	253.1
Fuel Cons., ℓ/100 km	13.60	11.67	10.38	15.77	12.51	11.06	15.63	12.24	11.00
Regulated Emissions									
Hydrocarbons (THC), g/km	0.59	0.28	0.25	0.79	0.25	0.26	0.82	0.30	0.26
Carbon Monoxide, g/km	7.56	1.91	1.68	20.40	5.78	2.50	21.17	6.24	2.43
Oxides of Nitrogen, g/km	1.11	1.23	1.40	1.24	1.26	1.48	1.12	1.26	1.38
Particulates									
Total Particulates	36.03	14.78	14.49	27.11	9.13	10.73	25.43	8.23	9.30
Sulfate	0.36	0.39	0.28	0.33	0.24	0.20	0.20	0.14	0.21
Sulfate as % of TFS, %	0.43	0.54	0.44	0.34	0.31	0.29	0.21	0.19	0.31
Compound Group Totals									
Aldehydes & Ketones	16.9	8.1	11.0	19.4	5.6	12.6	10.9	18.5	4.6
Individual Hydrocarbons	267.0	126.5	141.2	371.8	162.3	148.6	421.8	163.7	159.8
Organic Sulfides	0.39	0.12	0.00	0.46	0.18	0.00	0.19	0.12	0.20
Organic Amines	0.06	0.03	0.03	0.00	0.00	0.00	0.17	0.13	0.10
Other Compounds									
Ammonia	3.56	1.13	1.28	2.65	1.85	2.67	1.32	1.27	1.17
Cyanide & Cyanogen	1.77	0.16	0.15	0.92	0.77	2.19	2.52	0.53	2.08
DMNA	--	--	--	--	--	--	--	--	--
Hydrogen Sulfide	0.08	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00
Nickel Carbonyl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrous Oxide	2.92	2.89	3.88	2.19	3.5	4.8	3.73	3.45	3.66

TABLE C-1. CAR 111 - RICH BEST IDLE (Cont'd)
1977 AMC PACER - 49 STATE W/O CATALYST

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	111-11	111-12	111-13	111-21	111-22	111-23	111-31	111-32	111-33
Aldehydes and Ketones									
Formaldehyde	10.40	6.53	7.05	15.90	4.35	9.29	9.34	15.27	4.42
Acetaldehyde	3.58	1.17	2.11	3.03	1.08	2.90	1.43	3.09	0.08
Acetone	2.14	0.25	1.02	0.15	0.00	0.00	0.00	0.00	0.00
Isobutyraldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone	0.65	0.10	0.63	0.30	0.13	0.39	0.00	0.06	0.00
Crotonaldehyde	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.12	0.04	0.16	0.02	0.009	0.05	0.14	0.12	0.08
Benzaldehyde	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	16.9	8.1	11.0	19.4	5.6	12.6	10.9	18.5	4.6
Total as % of THC, %	2.9	2.9	4.4	2.5	2.2	4.3	1.3	6.2	1.8
Individual Hydrocarbons									
Methane	34.05	9.53	8.74	88.76	17.80	11.01	94.95	23.87	12.98
Ethylene	79.76	46.70	51.79	95.87	60.00	56.77	95.91	61.12	59.22
Ethane	6.20	2.48	2.33	6.02	2.19	1.85	7.40	3.47	2.52
Acetylene	29.43	13.80	14.52	49.39	17.57	17.51	57.12	18.12	18.72
Propane	0.49	0.00	0.00	1.57	0.0	0.0	1.13	0.13	0.05
Propylene	36.47	20.57	22.41	38.55	22.38	22.82	37.64	23.76	23.11
Benzene	35.61	16.58	17.58	42.45	20.82	18.69	61.70	25.56	25.51
Toluene	45.02	16.83	23.88	49.18	21.53	20.02	65.99	7.66	17.67
Total Individual HC	267.0	126.5	141.2	371.8	162.3	148.6	421.8	163.7	159.8
Total as % of THC, %	45.3	45.2	56.5	47.1	64.9	57.1	51.4	54.6	61.5
Organic Sulfides									
Carbonyl Sulfide	0.18	0.04	0.00	0.28	0.00	0.00	0.07	0.04	0.11
Methyl Sulfide	0.07	0.04	0.00	0.04	0.07	0.00	0.04	0.04	<0.01
Ethyl Sulfide	0.07	0.04	0.00	0.07	0.07	0.00	0.04	0.04	0.07
Methyl Disulfide	0.07	0.00	0.00	0.07	0.04	0.00	0.04	0.00	0.01
Organic Amines									
Monomethylamine	0.03	0.00	0.03	0.00	0.00	0.00	0.01	0.01	0.00
Monoethylamine	0.03	0.03	0.00	0.00	0.00	0.00	0.10	0.07	0.07
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.05	0.03
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE C-1. CAR 111 - RICH BEST IDLE (Cont'd)
1977 AMC PACER - 49 STATE W/O CATALYST

		EMISSION RATE, MG/KM (Except at Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		111-11	111-12	111-13	111-21	111-22	111-23	111-31	111-32	111-33
Other Elements										
Chromium	Cr									
Lead	Pb									
Manganese	Mn									
Arsenic	As									
Mercury	Hg									
Bromine	Br									
Phosphorus	P	0.02	0.02	0.02	0.01	0.02	0.02	0.01	0.02	0.02
Silicon	Si									
Cadmium	Cd									
Aluminum	Al									
Sulfur	S	0.09	0.13	0.11	0.05	0.07	0.08	0.03	0.12	0.07
Sodium	Na									
Fluorine	F									
Magnesium	Mg									
Potassium	K									
Chlorine	Cl									
Platinum	Pt									
Zinc	Zn									
Copper	Cu									
Nickel	Ni									
Iron	Fe	0.15	0.03		0.14			0.12	0.06	
Vanadium	V									
Titanium	Ti									
Barium	Ba	0.01	0.01	0.01	0.02	0.01		0.02	0.02	0.01
Calcium	Ca	0.01			0.01					

TABLE C-2. CAR 112 - 12 PERCENT IGNITION MISFIRE
1977 AMC PACER - 49 STATE W/O CATALYST

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	112-11	112-12	112-13	112-21	112-22	112-23	112-31	112-32	112-33
Barometer, mm Hg	741.9	737.9	737.9	742.4	742.4	742.4	742.7	742.4	742.4
Humidity, g/kg	12.4	9.8	10.7	11.1	10.9	10.9	9.6	10.6	11.7
Temperature, °C	26.1	25.6	28.3	27.2	27.8	29.4	21.1	26.7	26.7
Total Fuel Sulfur, mg/km	31.73	24.88	23.02	33.57	27.90	25.43	33.25	28.02	26.38
Avg. Exh. Oxygen, %	5.42	4.88	4.66	7.06	6.14	5.30	6.75	6.09	--
Catalyst Avg. Temp., °C	--	--	--	--	--	--	--	--	--
Catalyst Max. Temp., °C	--	--	--	--	--	--	--	--	--
Carbon Dioxide, g/km	326.1	264.3	246.3	308.7	266.5	245.7	307.5	266.1	247.5
Fuel Cons., ℓ/100 km	14.80	11.61	10.74	15.66	13.02	11.87	15.51	13.08	12.31
Regulated Emissions									
Hydrocarbons (THC), g/km	0.76	0.35	0.32	10.91	8.06	7.22	10.73	8.12	7.86
Carbon Monoxide, g/km	11.65	4.17	2.73	15.04	8.27	6.02	13.99	9.25	10.17
Oxides of Nitrogen, g/km	1.38	1.15	1.31	1.59	1.38	1.45	1.83	1.41	1.68
Particulates									
Total Particulates	28.38	12.54	14.60	48.05	28.17	25.11	48.40	30.17	24.81
Sulfate	0.15	0.24	0.31	1.14	0.97	0.75	1.07	1.03	0.90
Sulfate as % of TFS, %	0.16	0.32	0.45	1.13	1.16	0.98	1.07	1.23	1.14
Compound Group Totals									
Aldehydes & Ketones	7.5	11.2	22.6	82.8	182.5	165.3	164.2	121.6	290.8
Individual Hydrocarbons	369.	141.	157.	1446.9	600.8	1283.9	1262.	719.	1164.
Organic Sulfides	0.10	0.10	0.19	0.35	0.05	0.04	0.46	0.09	0.05
Organic Amines	0.00	0.00	0.00	0.24	0.00	0.00	0.20	0.14	0.09
Other Compounds									
Ammonia	1.02	--	--	2.10	--	--	2.06	--	--
Cyanide & Cyanogen	1.98	1.23	1.75	0.82	0.16	0.29	0.61	0.13	0.37
DMNA	--	--	--	--	--	--	--	--	--
Hydrogen Sulfide	0.00	0.00	0.00	0.51	0.18	0.23	0.40	0.09	0.05
Nickel Carbonyl	--	--	--	--	--	--	--	--	--
Nitrous Oxide	3.	3.	4.	3.	--	3.	4.	2.	4.

TABLE C-2. CAR 112 - 12 PERCENT IGNITION MISFIRE (CONT'D)
1977 AMC PACER - 49 STATE W/O CATALYST

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	112-11	112-12	112-13	112-21	112-22	112-23	112-31	112-32	112-33
Aldehydes and Ketones									
Formaldehyde	5.96	7.87	12.39	48.10	102.71	101.46	102.38	76.18	199.61
Acetaldehyde	1.17	2.56	6.07	21.92	48.15	42.66	40.16	31.59	59.29
Acetone	0.11	0.00	2.21	7.03	18.84	11.57	12.96	8.61	17.59
Isobutyraldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.00
Methyl Ethyl Ketone	0.15	0.53	1.45	4.40	9.58	7.10	6.20	2.83	10.55
Crotonaldehyde	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.07	0.19	0.47	1.37	3.23	2.46	2.46	1.56	3.75
Benzaldehyde	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	7.5	11.2	22.6	82.8	182.5	165.3	164.2	121.6	290.8
Total as % of THC, %	1.0	3.2	7.1	0.8	2.3	2.3	1.5	1.5	3.7
Individual Hydrocarbons									
Methane	49.	15.	14.	59.00	17.42	30.17	56.	24.	38.
Ethylene	107.	44.	52.	123.72	69.30	209.27	115.	80.	196.
Ethane	9.	3.	3.	10.77	5.79	15.60	10.	7.	16.
Acetylene	45.	15.	17.	42.49	11.18	25.56	30.	15.	22.
Propane	0.	0.	0.	4.67	1.46	2.41	6.	4.	5.
Propylene	47.	19.	22.	95.96	61.64	185.09	96.	70.	173.
Benzene	46.	18.	20.	265.70	96.38	191.61	194.	110.	153.
Toluene	66.	27.	29.	844.61	337.62	624.17	755.	409.	561.
Total Individual HC	369.	141.	157.	1446.9	600.8	1283.9	1262.	719.	1164.
Total as % of THC, %	49.	40.	49.	13.3	7.6	17.8	12.	9.	15.
Organic Sulfides									
Carbonyl Sulfide	0.09	0.00	0.00	0.34	0.04	0.04	0.46	0.08	0.04
Methyl Sulfide	0.01	0.08	0.18	0.00	0.00	0.00	0.00	0.00	0.00
Ethyl Sulfide	0.00	0.02	<0.01	<0.01	0.01	0.00	0.00	0.01	0.01
Methyl Disulfide	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
Organic Amines									
Monomethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.14	0.09
Monoethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00
Trimethylamine	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE C-2. CAR 112 - 12 PERCENT IGNITION MISFIRE (Cont'd)
1977 AMC PACER - 49 STATE W/O CATALYST

		EMISSION RATE, MG/KM (Except at Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		112-11	112-12	112-13	112-21	112-22	112-23	112-31	112-32	112-33
Other Elements										
Chromium	Cr									
Lead	Pb		0.27	0.70	0.19					
Manganese	Mn									
Arsenic	As									
Mercury	Hg									
Bromine	Br			0.46						
Phosphorus	P	0.01	0.02	0.01	0.02	0.02	0.02	0.01	0.02	0.02
Silicon	Si		0.01							
Cadmium	Cd									
Aluminum	Al									
Sulfur	S	0.02	0.05	0.06	0.10	0.06	0.01	0.05	0.07	0.04
Sodium	Na									
Fluorine	F									
Magnesium	Mg									
Potassium	K									
Chlorine	Cl		0.01	0.02	0.03			0.04		
Platinum	Pt									
Zinc	Zn									
Copper	Cu									
Nickel	Ni									
Iron	Fe	0.03	0.07	0.05	0.15	0.03		0.07	0.03	
Vanadium	V									
Titanium	Ti									
Barium	Ba		0.01		0.02	0.02	0.02	0.01	0.02	0.02
Calcium	Ca		0.02		0.01	0.01				

TABLE C-3. CAR 113 - DISABLED EGR
1977 AMC PACER - 49 STATE W/O CATALYST

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	113-11	113-12	113-13	113-21	113-22	113-23	113-31	113-32	113-33
Barometer, mm Hg	743.7	742.7	742.7	740.7	740.7	740.7	741.2	741.4	741.4
Humidity, g/kg	9.4	9.2	9.9	12.1	10.9	10.7	10.9	8.3	8.3
Temperature, °C	24.4	26.7	25.0	23.3	24.4	23.3	22.8	25.6	25.6
Total Fuel Sulfur, mg/km	31.10	24.45	21.30	30.65	23.42	21.25	30.61	23.19	20.41
Avg. Exh. Oxygen, %	6.27	5.33	4.81	5.64	5.48	5.10	5.78	5.69	5.17
Catalyst Avg. Temp., °C	--	--	--	--	--	--	--	--	--
Catalyst Max. Temp., °C	--	--	--	--	--	--	--	--	--
Carbon Dioxide, g/km	319.9	261.0	228.9	312.6	249.5	228.6	312.4	248.0	219.6
Fuel Cons., ℓ/100 km	14.51	11.41	9.94	14.30	10.93	9.91	14.28	10.82	9.52
Regulated Emissions									
Hydrocarbons, (THC), g/km	0.72	0.39	0.34	0.77	0.43	0.35	0.80	0.39	0.34
Carbon Monoxide, g/km	11.33	3.23	1.85	12.76	3.29	1.67	12.50	2.72	1.55
Oxides of Nitrogen, g/km	1.36	1.30	1.52	2.28	3.71	3.79	2.22	3.22	3.86
Particulates									
Total Particulates	24.59	10.96	8.03	17.31	9.72	6.31	15.31	9.93	7.30
Sulfate	1.33	0.29	0.14	0.81	0.25	0.26	0.36	0.22	0.16
Sulfate as % of TFS, %	1.43	0.40	0.22	0.88	0.36	0.41	0.39	0.32	0.26
Compound Group Totals									
Aldehydes & Ketones	10.0	9.1	14.9	16.7	8.3	7.3	14.1	8.3	7.2
Individual Hydrocarbons	369.	--	185.	--	--	--	--	--	--
Organic Sulfides	--	<0.01	0.02	--	0.02	0.01	0.13	0.01	0.02
Organic Amines	0.00	0.01	0.00	0.04	0.02	0.01	0.00	0.00	0.03
Other Compounds									
Ammonia	4.56	--	--	4.60	--	--	2.02	--	--
Cyanide & Cyanogen	3.31	0.98	2.89	4.25	0.85	7.67	3.97	0.90	6.45
DMNA	0.00	--	--	0.01	--	--	0.11	--	--
Hydrogen Sulfide	0.06	0.00	0.00	0.10	0.00	0.00	0.12	--	0.00
Nickel Carbonyl	--	--	--	--	--	--	--	--	--
Nitrous Oxide	3.	4.	4.	--	--	--	--	--	--

TABLE C-3. CAR 113 - DISABLED EGR (CONT'D)
1977 AMC PACER - 49 STATE W/O CATALYST

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	113-11	113-12	113-13	113-21	113-22	113-23	113-31	113-32	113-33
Aldehydes and Ketones									
Formaldehyde	8.75	7.72	11.34	11.36	7.05	4.87	10.75	4.76	5.80
Acetaldehyde	0.68	0.95	2.94	3.19	0.85	1.41	1.22	2.04	0.15
Acetone	0.00	0.00	0.00	1.14	0.00	0.33	0.88	1.09	0.84
Isobutyraldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone	0.24	0.21	0.31	0.77	0.24	0.42	1.22	0.34	0.27
Crotonaldehyde	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.31	0.19	0.28	0.27	0.11	0.26	0.06	0.08	0.15
Benzaldehyde	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	10.0	9.1	14.9	16.7	8.3	7.3	14.1	8.3	7.2
Total as % of THC, %	1.4	2.3	4.4	2.2	1.9	2.1	1.8	2.1	2.1
Individual Hydrocarbons									
Methane	76.	--	39.	--	--	--	--	--	--
Ethylene	76.	--	48.	--	--	--	--	--	--
Ethane	7.	--	3.	--	--	--	--	--	--
Acetylene	36.	--	15.	--	--	--	--	--	--
Propane	7.	--	8.	--	--	--	--	--	--
Propylene	36.	--	23.	--	--	--	--	--	--
Benzene	46.	--	21.	--	--	--	--	--	--
Toluene	85.	--	27.	--	--	--	--	--	--
Total Individual HC	369.	--	185.	--	--	--	--	--	--
Total as % of THC, %	51.	--	54.	--	--	--	--	--	--
Organic Sulfides									
Carbonyl Sulfide	--	0.00	0.01	--	0.01	0.00	0.07	0.00	0.00
Methyl Sulfide	--	<0.01	0.00	--	0.01	0.00	0.05	0.01	0.02
Ethyl Sulfide	--	0.00	0.01	--	0.00	0.01	0.01	0.00	0.00
Methyl Disulfide	--	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00
Organic Amines									
Monomethylamine	0.00	0.01	0.00	0.03	0.01	0.01	0.00	0.00	0.03
Monoethylamine	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE C-3. CAR 113 - DISABLED EGR (Cont'd)
1977 AMC PACER - 49 STATE W/O CATALYST

		EMISSION RATE, MG/KM (Except at Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		113-11	113-12	113-13	113-21	113-22	113-23	113-31	113-32	113-33
Other Elements										
Chromium	Cr							No Data for this test		
Lead	Pb*	--	--	--	--	--	--		--	--
Manganese	Mn									
Arsenic	As									
Mercury	Hg									
Bromine	Br									
Phosphorus	P	0.01			0.01	0.01				
Silicon	Si									
Cadmium	Cd									
Aluminum	Al									
Sulfur	S	0.03	0.06	0.03	0.02	0.04	0.03		0.02	0.02
Sodium	Na									
Fluorine	F									
Magnesium	Mg									
Potassium	K									
Chlorine	Cl	0.01								
Platinum	Pt									
Zinc	Zn									
Copper	Cu						0.05			
Nickel	Ni									
Iron	Fe	0.05	0.02		0.15	0.06				
Vanadium	V									
Titanium	Ti									
Barium	Ba	0.01	0.01	0.01	0.01	0.01	0.01		0.01	
Calcium	Ca									

*Blank filter had high Pb

TABLE C-4. CAR 114 - HIGH OIL CONSUMPTION
1977 AMC PACER - 49 STATE W/O CATALYST

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	114-11	114-12	114-13	114-21	114-22	114-23	114-31	114-32	114-33
Barometer, mm Hg	742.4	742.7	742.7	740.2	740.2	740.2	739.1	739.6	739.6
Humidity, g/kg	9.7	9.5	10.4	11.4	9.5	8.8	10.7	10.0	10.0
Temperature, °C	22.2	24.4	23.9	23.3	24.4	26.1	21.7	25.0	23.3
Total Fuel Sulfur, mg/km	31.94	25.33	23.38	32.26	25.39	20.22	32.08	25.71	22.80
Avg. Exh. Oxygen, %	5.76	5.30	4.85	5.57	5.14	4.56	5.70	5.04	4.54
Catalyst Avg. Temp., °C	--	--	--	--	--	--	--	--	--
Catalyst Max. Temp., °C	--	--	--	--	--	--	--	--	--
Carbon Dioxide, g/km	324.6	267.2	251.1	309.4	260.9	215.7	309.3	264.0	243.3
Fuel Cons., ℓ/100 km	14.91	11.82	10.91	15.05	11.85	9.43	14.97	12.00	10.64
Regulated Emissions									
Hydrocarbons, (THC), g/km	0.83	0.46	0.34	1.14	0.54	0.28	1.09	0.51	0.36
Carbon Monoxide, g/km	14.03	5.28	2.16	25.22	9.55	2.85	24.17	9.80	3.10
Oxides of Nitrogen, g/km	1.26	1.26	1.36	1.27	1.30	1.19	1.20	1.29	1.57
Particulates									
Total Particulates	36.33	20.65	14.38	46.19	25.92	22.71	39.04	21.85	16.54
Sulfate	0.89	0.35	0.23	1.22	0.79	0.50	1.38	0.58	0.51
Sulfate as % of TFS, %	0.93	0.46	0.33	1.26	1.04	0.82	1.43	0.75	0.75
Compound Group Totals									
Aldehydes & Ketones	19.1	27.6	17.7	33.4	24.4	21.0	29.2	20.1	11.8
Individual Hydrocarbons	259.	146.	--	--	--	--	--	--	--
Organic Sulfides	0.11	0.03	0.08	0.02	0.05	0.05	0.32	0.03	0.03
Organic Amines	0.04	0.03	0.01	0.00	0.03	0.05	0.00	0.00	0.01
Other Compounds									
Ammonia	--	--	--	--	--	--	--	--	--
Cyanide & Cyanogen	--	--	--	--	--	--	--	--	--
DMNA	--	--	--	--	--	--	--	--	--
Hydrogen Sulfide	0.03	0.00	0.00	0.43	0.07	0.00	0.18	0.00	0.00
Nickel Carbonyl	--	--	--	--	--	--	--	--	--
Nitrous Oxide	3.	2.	4.	4.	3.	2.	--	3.	2.

TABLE C-4. CAR 114 - HIGH OIL CONSUMPTION (CONT'D)
1977 AMC PACER - 49 STATE W/O CATALYST

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	114-11	114-12	114-13	114-21	114-22	114-23	114-31	114-32	114-33
Aldehydes and Ketones									
Formaldehyde	13.73	20.50	12.66	23.86	17.91	14.73	19.59	16.50	8.84
Acetaldehyde	3.95	5.43	4.06	7.35	5.01	5.31	7.11	2.96	2.48
Acetone	0.81	1.08	0.59	1.35	0.92	0.63	1.19	0.35	0.34
Isobutyraldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone	0.37	0.47	0.31	0.61	0.54	0.24	0.67	0.12	0.08
Crotonaldehyde	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.27	0.15	0.10	0.20	0.04	0.08	0.67	0.14	0.09
Benzaldehyde	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	19.1	27.6	17.7	33.4	24.4	21.0	29.2	20.1	11.8
Total as % of THC, %	2.3	6.0	5.2	2.9	4.5	7.5	2.7	3.9	3.3
Individual Hydrocarbons									
Methane	31.	14.	--	--	--	--	--	--	--
Ethylene	71.	48.	--	--	--	--	--	--	--
Ethane	7.	4.	--	--	--	--	--	--	--
Acetylene	29.	16.	--	--	--	--	--	--	--
Propane	13.	3.	--	--	--	--	--	--	--
Propylene	31.	21.	--	--	--	--	--	--	--
Benzene	32.	18.	--	--	--	--	--	--	--
Toluene	45.	22.	--	--	--	--	--	--	--
Total Individual HC	259.	146.	--	--	--	--	--	--	--
Total as % of THC, %	31.	32.	--	--	--	--	--	--	--
Organic Sulfides									
Carbonyl Sulfide	0.05	0.00	0.06	<0.01	0.01	0.03	0.19	0.00	0.01
Methyl Sulfide	0.06	0.03	0.02	0.01	0.04	0.02	0.13	0.03	0.02
Ethyl Sulfide	0.00	0.00	0.00	0.00	0.00	0.00	<0.01	0.00	0.00
Methyl Disulfide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Organic Amines									
Monomethylamine	0.00	0.01	0.01	0.00	0.01	0.02	0.00	0.00	0.00
Monoethylamine	0.04	0.02	0.00	0.00	0.02	0.03	0.00	0.00	0.01
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE C-4. CAR 114 - HIGH OIL CONSUMPTION (Cont'd)
1977 AMC PACER - 49 STATE W/O CATALYST

		EMISSION RATE, MG/KM (Except at Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		114-11	114-12	114-13	114-21	114-22	114-23	114-31	114-32	114-33
Other Elements										
Chromium	Cr									
Lead	Pb*	--	--	--	--	--	--	--	--	--
Manganese	Mn									
Arsenic	As									
Mercury	Hg									
Bromine	Br									
Phosphorus	P	0.01	0.01		0.50	0.59	0.08	0.46	0.42	0.33
Silicon	Si				0.01	0.01	0.40	0.01	0.01	0.01
Cadmium	Cd									
Aluminum	Al									
Sulfur	S	0.05	0.04	0.03	0.13	0.12	0.02	0.09	0.08	0.07
Sodium	Na					0.08				
Fluorine	F									
Magnesium	Mg	0.01			0.26	0.22	0.14	0.24	0.15	0.11
Potassium	K									
Chlorine	Cl	0.02			0.07	0.05		0.10	0.06	0.02
Platinum	Pt									
Zinc	Zn	0.02			0.36	0.37	0.28	0.33	0.27	0.22
Copper	Cu						0.05			
Nickel	Ni									
Iron	Fe	0.35	0.05	0.04	0.68	0.18	0.04	0.21	0.04	0.03
Vanadium	V									
Titanium	Ti									
Barium	Ba	0.03	0.02	0.01	0.73	0.66	0.40	0.71	0.45	0.31
Calcium	Ca	0.02			0.02	0.02	0.01	0.02	0.02	0.01

*Blank filter had high Pb

TABLE C-5. CAR 121 - RICH BEST IDLE
1978 CHEVROLET MALIBU - 49 STATE

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	121-11	121-12	121-13	121-21	121-22	121-23	121-31	121-32	121-33
Barometer, mm Hg	741.93	741.9	741.9	733.3	733.3	733.3	738.6	738.9	738.9
Humidity, g/kg	11.6	9.7	8.8	9.9	11.0	11.0	9.5	9.3	9.3
Temperature, °C	24.4	23.9	24.4	23.9	24.4	24.4	24.4	25.0	25.0
Total Fuel Sulfur, mg/km	28.66	22.24	19.03	30.11	23.67	20.31	30.13	23.81	19.95
Avg. Exh. Oxygen, %	2.50	2.05	1.50	1.10	0.65	2.85	1.50	1.20	1.10
Catalyst Avg. Temp., °C	392.	499.	515.	373.	497.	517.	367.	493.	516.
Catalyst Max. Temp., °C	474.	576.	584.	487.	614.	623.	478.	601.	610.
Carbon Dioxide, g/km	317.8	251.5	215.9	298.9	253.7	227.4	299.2	258.5	224.7
Fuel Cons., ℓ/100 km	13.95	10.82	9.26	14.65	11.52	9.88	14.66	11.59	9.71
Regulated Emissions									
Hydrocarbons (THC), g/km	0.30	0.05	0.04	1.07	0.37	0.10	1.09	0.30	0.09
Carbon Monoxide, g/km	5.06	1.22	0.58	26.11	9.53	2.41	25.93	7.62	1.55
Oxides of Nitrogen, g/km	0.84	0.95	0.96	0.59	0.84	1.13	0.54	0.90	1.07
Particulates									
Total Particulates	9.59	1.36	1.75	12.90	4.86	5.11	5.94	0.33	0.37
Sulfate	0.19	0.08	0.06	0.46	0.15	0.01	0.36	0.12	0.09
Sulfate as % of TFS, %	0.22	0.12	0.11	0.51	0.21	0.02	0.40	0.17	0.15
Compound Group Totals									
Aldehydes & Ketones	0.7	1.0	--	2.6	0.2		1.3	0.0	0.6
Individual Hydrocarbons	146.9	42.1	29.9	554.2	242.4	74.2	498.7	215.9	56.2
Organic Sulfides	0.11	0.08	0.14	2.12	0.53	--	0.19	0.78	0.70
Organic Amines	0.00	0.00	0.00	0.15	0.12	0.15	0.09	0.06	0.13
Other Compounds									
Ammonia	2.54	1.85	1.95	15.75	25.51	16.04	20.09	18.07	10.47
Cyanide & Cyanogen	0.37	0,12	0.05	3.01	2.52	1.14	2.57	0.94	0.54
DMNA	--	--	--	0.00	--	--	--	--	--
Hydrogen Sulfide	0.00	0.00	0.00	0.13	2.89	1.35	0.11	1.82	0.65
Nickel Carbonyl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrous Oxide	40.24	36.71	16.51	56.76	50.4	35.82	57.83	38.50	18.35

TABLE C-5. CAR 121 - RICH BEST IDLE (Cont'd)
1978 CHEVROLET MALIBU - 49 STATE

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	121-11	121-12	121-13	121-21	121-22	121-23	121-31	121-32	121-33
Aldehydes and Ketones									
Formaldehyde	0.53	1.01	1.85	1.38	0.14	0.34	1.23	0.00	0.53
Acetaldehyde	0.16	0.00	0.57	0.81	0.00	0.00	0.00	0.00	0.00
Acetone	0.02	0.00	--	0.00	0.00	--	0.00	0.00	0.00
Isobutyraldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00
Methyl Ethyl Ketone	0.00	0.00	0.80	0.40	0.04	0.18	0.00	0.00	0.00
Crotonaldehyde	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.00	0.03	0.55	0.04	0.00	0.00	0.04	0.00	0.08
Benzaldehyde	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	0.7	1.0	--	2.6	0.2	--	1.3	0.0	0.6
Total as % of THC, %	0.2	2.0	--	0.2	0.1	--	0.1	0.0	0.7
Individual Hydrocarbons									
Methane	43.43	21.09	17.74	125.29	57.10	28.42	121.52	52.92	23.60
Ethylene	26.16	3.70	2.93	137.66	48.50	8.75	124.52	41.88	7.83
Ethane	10.35	4.64	4.61	23.81	12.03	6.68	24.40	11.14	5.67
Acetylene	7.38	0.00	0.00	12.64	0.0	0.0	12.30	0.00	0.00
Propane	0.55	0.06	0.04	1.86	0.88	0.49	2.30	0.59	0.17
Propylene	12.16	1.14	1.24	46.57	20.60	3.65	50.29	18.49	2.92
Benzene	16.60	5.76	3.36	92.88	53.92	17.74	79.26	48.65	11.42
Toluene	30.39	5.74	0.00	113.46	49.41	8.48	84.10	42.29	4.65
Total Individual HC	146.9	42.1	29.9	554.2	242.4	74.2	498.7	216.0	56.2
Total as % of THC, %	49.0	84.3	74.8	51.8	65.5	74.2	45.7	72.0	62.5
Organic Sulfides									
Carbonyl Sulfide	0.04	0.04	0.00	1.97	--	--	0.14	--	--
Methyl Sulfide	0.00	0.00	0.00	0.01	0.04	--	0.01	0.11	0.07
Ethyl Sulfide	0.07	0.04	0.14	0.14	0.49	--	0.14	0.39	0.56
Methyl Disulfide	0.00	0.00	0.00	0.00	0.00	--	0.04	0.28	0.07
Organic Amines									
Monomethylamine	0.00	0.00	0.00	0.00	0.03	0.02	0.00	0.00	0.00
Monoethylamine	0.00	0.00	0.00	0.11	0.09	0.13	0.08	0.06	0.13
Trimethylamine	0.00	0.00	0.00	0.04	0.00	0.00	0.01	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE C-5. CAR 121 - RICH BEST IDLE (Cont'd)
1978 CHEVROLET MALIBU - 49 STATE

		EMISSION RATE, MG/KM (Except at Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		121-11	121-12	121-13	121-21	121-22	121-23	121-31	121-32	121-33
Other Elements										
Chromium	Cr									
Lead	Pb									
Manganese	Mn									
Arsenic	As									
Mercury	Hg									
Bromine	Br									
Phosphorus	P									
Silicon	Si									
Cadmium	Cd									
Aluminum	Al	0.02	0.01		0.02	0.01		0.03	0.01	
Sulfur	S	0.01	0.02	0.02	0.02	0.03	0.02	0.04	0.02	0.01
Sodium	Na									
Fluorine	F									
Magnesium	Mg									
Potassium	K									
Chlorine	Cl							0.01		
Platinum	Pt									
Zinc	Zn									
Copper	Cu									
Nickel	Ni									
Iron	Fe	0.18	0.05		0.34	0.27	0.06	0.68	0.15	0.08
Vanadium	V									
Titanium	Ti									
Barium	Ba	0.01	0.02	0.01	0.01	0.01		0.01	0.01	0.01
Calcium	Ca									

TABLE C-6. CAR 122 - 12 PERCENT IGNITION MISFIRE
1978 CHEVROLET MALIBU - 49 STATE

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	122-11	122-12	122-13	122-21	122-22	122-23	122-31	122-32	122-33
Barometer, mm Hg	743.7	744.5	742.9	739.1	739.1	739.1	739.4	739.6	739.6
Humidity, g/kg	14.2	11.3	10.6	9.8	8.2	8.4	10.3	9.1	9.7
Temperature, °C	27.2	26.7	26.7	22.2	22.8	25.6	21.1	23.9	25.6
Total Fuel Sulfur, mg/km	29.74	22.93	20.64	31.14	23.87	21.80	30.96	24.47	22.22
Avg. Exh. Oxygen, %	1.83	1.73	1.43	2.49	2.01	0.97	2.12	1.74	0.93
Catalyst Avg. Temp., °C	378.	490.	557.	486.	632.	731.	489.	634.	712.
Catalyst Max. Temp., °C	474.	584.	597.	636.	756.	773.	627.	756.	777.
Carbon Dioxide, g/km	315.7	249.2	225.3	324.	253.5	234.9	322.1	259.7	239.6
Fuel Cons., ℓ/100 km	13.88	10.70	9.63	14.53	11.14	10.17	14.45	11.42	10.37
Regulated Emissions									
Hydrocarbons, (THC), g/km	0.28	0.06	0.02	1.78	0.28	0.09	1.78	0.27	0.08
Carbon Monoxide, g/km	5.46	0.85	0.18	6.84	4.23	2.00	6.84	4.42	1.93
Oxides of Nitrogen, g/km	0.70	0.96	1.12	0.93	1.03	1.18	0.88	1.10	1.42
Particulates									
Total Particulates	--	2.32	1.47	4.61	1.00	0.87	3.79	0.36	0.52
Sulfate	0.54	0.12	0.07	0.14	0.16	0.15	0.41	0.12	0.09
Sulfate as % of TFS, %	0.61	0.17	0.11	0.15	0.22	0.23	0.44	0.16	0.14
Compound Group Totals									
Aldehydes & Ketones	1.2	1.1	0.7	4.2	0.3	0.7	5.8	1.4	0.3
Individual Hydrocarbons	--	--	--	--	--	--	--	--	--
Organic Sulfides	0.69	0.61	0.01	0.05	0.08	0.03	0.06	<0.01	0.06
Organic Amines	0.00	0.00	0.00	0.01	0.04	0.03	0.00	0.00	0.00
Other Compounds									
Ammonia	1.98	2.21	4.95	8.49	--	--	5.25	--	--
Cyanide & Cyanogen	0.59	0.24	0.09	2.81	1.89	2.44	2.48	1.98	0.63
DMNA	--	--	--	0.14	--	--	0.02	--	--
Hydrogen Sulfide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nickel Carbonyl	--	--	--	--	--	--	--	--	--
Nitrous Oxide	42.	21.	--	19.	10.	7.	33.	14.	12.

TABLE C-6. CAR 122 - 12 PERCENT IGNITION MISFIRE (CONT'D)
1978 CHEVROLET MALIBU - 49 STATE

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	122-11	122-12	122-13	122-21	122-22	122-23	122-31	122-32	122-33
Aldehydes and Ketones									
Formaldehyde	1.04	1.00	0.69	2.33	0.22	0.50	2.25	0.27	0.25
Acetaldehyde	0.00	0.00	0.00	1.47	0.00	0.00	2.76	0.59	0.00
Acetone	0.00	0.00	0.00	0.00	0.00	0.00	0.59	0.44	0.00
Isobutyraldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone	0.00	0.00	0.00	0.18	0.00	0.00	0.18	0.09	0.06
Crotonaldehyde	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.14	0.07	0.00	0.20	0.04	0.17	0.00	0.05	0.00
Benzaldehyde	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	1.2	1.1	0.7	4.2	0.3	0.7	5.8	1.4	0.3
Total as % of THC, %	0.4	0.1	3.5	0.2	0.1	0.7	0.3	0.5	0.4
Individual Hydrocarbons									
Methane	--	--	--	--	--	--	--	--	--
Ethylene	--	--	--	--	--	--	--	--	--
Ethane	--	--	--	--	--	--	--	--	--
Acetylene	--	--	--	--	--	--	--	--	--
Propane	--	--	--	--	--	--	--	--	--
Propylene	--	--	--	--	--	--	--	--	--
Benzene	--	--	--	--	--	--	--	--	--
Toluene	--	--	--	--	--	--	--	--	--
Total Individual HC	--	--	--	--	--	--	--	--	--
Total as % of THC, %	--	--	--	--	--	--	--	--	--
Organic Sulfides									
Carbonyl Sulfide	0.52	0.51	0.00	0.04	0.00	0.00	0.05	<0.01	0.06
Methyl Sulfide	0.12	0.05	0.01	0.04	0.08	0.03	0.01	0.00	0.00
Ethyl Sulfide	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Disulfide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Organic Amines									
Monomethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Monoethylamine	0.00	0.00	0.00	0.01	0.04	0.03	0.00	0.00	0.00
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE C-6. CAR 122 - 12 PERCENT IGNITION MISFIRE (Cont'd)
1978 CHEVROLET MALIBU - 49 STATE

		EMISSION RATE, MG/KM (Except at Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		122-11	122-12	122-13	122-21	122-22	122-23	122-31	122-32	122-33
Other Elements										
Chromium	Cr									
Lead	Pb									
Manganese	Mn									
Arsenic	As									
Mercury	Hg									
Bromine	Br									
Phosphorus	P		0.01						0.01	
Silicon	Si	0.01						0.01		
Cadmium	Cd									
Aluminum	Al	0.01	0.01		0.02	0.02		0.02	0.01	
Sulfur	S	0.02	0.02	0.01	0.03	0.07	0.04	0.02	0.05	0.05
Sodium	Na									
Fluorine	F									
Magnesium	Mg									
Potassium	K									
Chlorine	Cl		0.01			0.02				
Platinum	Pt									
Zinc	Zn									
Copper	Cu									
Nickel	Ni									
Iron	Fe	0.05	0.22		0.10	0.08		0.09	0.04	
Vanadium	V									
Titanium	Ti									
Barium	Ba	0.02	0.02	0.01	0.02	0.01	0.01	0.02	0.01	0.01
Calcium	Ca	0.01								

TABLE C-7. CAR 123 - DISABLED EGR
1978 CHEVROLET MALIBU - 49 STATE

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	123-11	123-12	123-13	123-21	123-22	123-23	123-31	123-32	123-33
Barometer, mm Hg	742.7	743.2	743-2	740.2	740.9	740.9	741.7	741.7	741.7
Humidity, g/kg	11.4	8.8	9.9	10.7	9.0	8.4	10.9	8.9	8.6
Temperature, °C	21.7	22.8	23.3	21.7	23.9	23.9	21.1	22.8	25.0
Total Fuel Sulfur, mg/km	30.00	23.37	20.94	28.11	21.82	19.71	28.54	21.95	19.89
Avg. Exh. Oxygen, %	2.05	1.86	1.14	2.37	1.70	1.07	2.28	1.80	1.15
Catalyst Avg. Temp., °C	378.	486.	555.	371.	501.	563.	389.	503.	566.
Catalyst Max. Temp., °C	469.	576.	601.	474.	601.	618.	487.	606.	623.
Carbon Dioxide, g/km	315.2	253.2	227.3	296.4	235.6	213.8	301.0	236.3	215.3
Fuel Cons., ℓ/100 km	14.00	10.90	9.77	13.12	10.18	9.20	13.32	10.24	9.28
Regulated Emissions									
Hydrocarbons, (THC), g/km	0.39	0.05	0.03	0.33	0.06	0.04	0.34	0.07	0.05
Carbon Monoxide, g/km	7.38	1.37	0.96	6.31	1.77	0.99	6.35	2.21	1.27
Oxides of Nitrogen, g/km	0.69	0.91	1.05	1.13	1.43	1.57	1.09	1.40	1.54
Particulates									
Total Particulates	4.35	0.96	0.53	8.75	1.24	0.53	4.34	2.08	0.97
Sulfate	1.17	0.06	0.08	0.33	0.06	0.06	0.20	0.07	0.09
Sulfate as % of TFS, %	1.3	0.09	0.13	0.39	0.09	0.10	0.23	0.11	0.15
Compound Group Totals									
Aldehydes & Ketones	2.1	1.0	0.9	4.8	2.1	1.2	2.6	0.9	1.1
Individual Hydrocarbons	--	--	--	--	--	--	--	--	--
Organic Sulfides	0.85	0.00	0.00	0.19	0.03	0.00	0.03	0.04	0.01
Organic Amines	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Compounds									
Ammonia	4.65	--	--	2.10	--	--	2.99	--	--
Cyanide & Cyanogen	0.84	0.09	0.34	1.44	0.63	0.55	2.32	0.92	0.61
DMNA	0.00	--	--	--	--	--	0.00	--	--
Hydrogen Sulfide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.12
Nickel Carbonyl	--	--	--	--	--	--	--	--	--
Nitrous Oxide	--	--	--	51.	68.	32.	56.	73.	--

TABLE C-7. CAR 123 - DISABLED EGR (CONT'D)
1978 CHEVROLET MALIBU - 49 STATE

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	123-11	123-12	123-13	123-21	123-22	123-23	123-31	123-32	123-33
Aldehydes and Ketones									
Formaldehyde	1.60	0.86	0.69	2.81	1.34	0.97	1.63	0.77	0.78
Acetaldehyde	0.27	0.00	0.00	1.25	0.45	0.00	0.51	0.00	0.00
Acetone	0.00	0.00	0.00	0.39	0.17	0.00	0.14	0.00	0.00
Isobutyraldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone	0.00	0.00	0.00	0.22	0.09	0.14	0.15	0.09	0.15
Crotonaldehyde	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.18	0.17	0.16	0.08	0.04	0.08	0.13	0.04	0.19
Benzaldehyde	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	2.1	1.0	0.9	4.8	2.1	1.2	2.6	0.9	1.1
Total as % of THC, %	0.5	2.0	3.0	1.5	3.5	3.0	0.8	1.3	2.2
Individual Hydrocarbons									
Methane	--	--	--	--	--	--	--	--	--
Ethylene	--	--	--	--	--	--	--	--	--
Ethane	--	--	--	--	--	--	--	--	--
Acetylene	--	--	--	--	--	--	--	--	--
Propane	--	--	--	--	--	--	--	--	--
Propylene	--	--	--	--	--	--	--	--	--
Benzene	--	--	--	--	--	--	--	--	--
Toluene	--	--	--	--	--	--	--	--	--
Total Individual HC	--	--	--	--	--	--	--	--	--
Total as % of THC, %	--	--	--	--	--	--	--	--	--
Organic Sulfides									
Carbonyl Sulfide	0.21	0.00	0.00	0.15	<0.01	0.00	0.03	0.01	0.00
Methyl Sulfide	0.60	0.00	0.00	0.02	0.01	0.00	0.00	0.03	0.00
Ethyl Sulfide	0.04	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.01
Methyl Disulfide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Organic Amines									
Monomethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Monoethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE C-7. CAR 123 - DISABLED EGR (Cont'd)
1978 CHEVROLET MALIBU - 49 STATE

		EMISSION RATE, MG/KM (Except at Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		123-11	123-12	123-13	123-21	123-22	123-23	123-31	123-32	123-33
Other Elements										
Chromium	Cr									
Lead	Pb*	--	--	--	--	--	--	--	--	--
Manganese	Mn									
Arsenic	As									
Mercury	Hg									
Bromine	Br									
Phosphorus	P									
Silicon	Si	0.01			0.03					
Cadmium	Cd									
Aluminum	Al	0.01			0.01			0.01		
Sulfur	S	0.01	0.01		0.24	0.01	0.01		0.01	0.02
Sodium	Na									
Fluorine	F									
Magnesium	Mg									
Potassium	K									
Chlorine	Cl	0.02			0.05					
Platinum	Pt									
Zinc	Zn				0.05					
Copper	Cu									
Nickel	Ni				0.21					
Iron	Fe	0.04			1.28	0.04		0.02	0.03	
Vanadium	V									
Titanium	Ti									
Barium	Ba	0.01	0.01		0.01	0.01	0.01	0.01		
Calcium	Ca	0.02			0.04					

* Blank filter had high Pb

TABLE C-8. CAR 124 - HIGH OIL CONSUMPTION
1978 CHEVROLET MALIBU - 49 STATE

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	124-11	124-12	124-13	124-21	124-22	124-23	124-31	124-32	124-33
Barometer, mm Hg	741.2	742.4	742.4	736.3	737.1	737.1	739.9	739.9	739.4
Humidity, g/kg	11.4	9.4	9.0	11.9	9.2	8.9	10.9	10.7	10.0
Temperature, °C	21.7	22.8	23.9	22.2	22.2	24.4	22.8	25.0	25.0
Total Fuel Sulfur, mg/km	28.05	21.86	19.94	30.58	23.48	20.80	29.16	22.45	21.63
Avg. Exh. Oxygen, %	1.90	1.71	1.36	1.36	1.01	0.71	1.33	1.17	0.63
Catalyst Avg. Temp., °C	388.	491.	559.	385.	499.	558.	384.	507.	572.
Catalyst Max. Temp., °C	491.	606.	617.	474.	584.	606.	477.	599.	627.
Carbon Dioxide, g/km	299.1	237.8	217.5	315.9	247.9	224.3	299.6	236.2	231.0
Fuel Cons., ℓ/100 km	13.09	10.20	9.30	14.27	10.96	9.70	13.61	10.48	10.09
Regulated Emissions									
Hydrocarbons, (THC), g/km	0.26	0.04	0.02	0.55	0.20	0.08	0.59	0.21	0.11
Carbon Monoxide, g/km	4.24	0.65	0.25	10.59	5.21	1.77	11.02	5.50	3.30
Oxides of Nitrogen, g/km	0.76	0.87	0.95	0.60	0.76	0.93	0.54	0.70	0.84
Particulates									
Total Particulates	3.61	0.84	0.71	7.17	3.06	7.48	11.73	4.65	1.66
Sulfate	1.91	0.17	0.21	1.63	0.15	0.14	4.04	0.23	0.14
Sulfate as % of TFS, %	2.27	0.26	0.35	1.78	0.21	0.22	4.62	0.34	0.22
Compound Group Totals									
Aldehydes & Ketones	2.6	3.4	1.0	1.1	0.1	0.3	0.4	0.5	0.2
Individual Hydrocarbons	--	--	--	--	--	--	215.	56.	--
Organic Sulfides	0.22	0.08	0.00	0.17	0.53	0.64	0.37	0.65	0.02
Organic Amines	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Other Compounds									
Ammonia	--	--	--	--	--	--	--	--	--
Cyanide & Cyanogen	--	--	--	--	--	--	--	--	--
DMNA	0.15	--	--	--	--	--	--	--	--
Hydrogen Sulfide	0.00	0.03	0.03	0.00	0.10	0.00	0.00	0.28	0.40
Nickel Carbonyl	--	--	--	--	--	--	--	--	--
Nitrous Oxide	--	--	--	29.	--	15.	35.	44 .	16.

TABLE C-8. CAR 124 - HIGH OIL CONSUMPTION (CONT'D)
1978 CHEVROLET MALIBU - 49 STATE

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	124-11	124-12	124-13	124-21	124-22	124-23	124-31	124-32	124-33
Aldehydes and Ketones									
Formaldehyde	1.24	0.87	0.49	0.33	0.00	0.00	0.00	0.00	0.00
Acetaldehyde	0.79	0.61	0.16	0.40	0.00	0.00	0.00	0.36	0.16
Acetone	0.18	1.59	0.00	0.04	0.00	0.00	0.14	0.00	0.00
Isobutyraldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.06	0.00
Methyl Ethyl Ketone	0.25	0.22	0.22	0.21	0.09	0.06	0.09	0.03	0.00
Crotonaldehyde	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.11	0.13	0.09	0.13	0.00	0.28	0.06	0.06	0.08
Benzaldehyde	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	2.6	3.4	1.0	1.1	0.1	0.3	0.4	0.5	0.2
Total as % of THC, %	1.0	9.3	5.0	0.2	0.1	0.4	0.1	0.2	0.2
Individual Hydrocarbons									
Methane	--	--	--	--	--	--	52.	10.	--
Ethylene	--	--	--	--	--	--	44.	10.	--
Ethane	--	--	--	--	--	--	10.	3.	--
Acetylene	--	--	--	--	--	--	8.	0.	--
Propane	--	--	--	--	--	--	0.	7.	--
Propylene	--	--	--	--	--	--	20.	4.	--
Benzene	--	--	--	--	--	--	40.	16.	--
Toluene	--	--	--	--	--	--	41.	6.	--
Total Individual HC	--	--	--	--	--	--	215.	56.	--
Total as % of THC, %	--	--	--	--	--	--	36.	27.	--
Organic Sulfides									
Carbonyl Sulfide	0.08	0.00	0.00	0.09	0.39	0.46	0.25	0.49	0.00
Methyl Sulfide	0.14	0.08	0.00	0.07	0.05	0.08	0.07	0.05	0.02
Ethyl Sulfide	0.00	0.00	0.00	0.01	0.08	0.08	0.05	0.11	0.00
Methyl Disulfide	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.01	0.00
Organic Amines									
Monomethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Monoethylamine	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE C-8. CAR 124 - HIGH OIL CONSUMPTION (Cont'd)
1978 CHEVROLET MALIBU - 49 STATE

		EMISSION RATE, MG/KM (Except at Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		124-11	124-12	124-13	124-21	124-22	124-23	124-31	124-32	124-33
Other Elements										
Chromium	Cr									
Lead	Pb		0.01		0.01	0.04				
Manganese	Mn									
Arsenic	As									
Mercury	Hg									
Bromine	Br									
Phosphorus	P				0.19	0.22	0.13	0.29	0.23	0.14
Silicon	Si							0.01	0.01	
Cadmium	Cd									
Aluminum	Al	0.01	0.01					0.01		
Sulfur	S		0.02	0.05	0.04	0.04	0.02	0.04	0.02	0.01
Sodium	Na									
Fluorine	F									
Magnesium	Mg				0.16	0.18	0.09	0.22	0.17	0.10
Potassium	K									
Chlorine	Cl				0.14	0.17	0.08	0.19	0.15	0.11
Platinum	Pt									
Zinc	Zn				0.11	0.13	0.07	0.16	0.12	0.07
Copper	Cu									
Nickel	Ni									
Iron	Fe				0.05	0.05		0.06	0.02	
Vanadium	V									
Titanium	Ti									
Barium	Ba	0.01	0.01	0.01	0.44	0.50	0.28	0.60	0.48	0.27
Calcium	Ca				0.01	0.01		0.01	0.01	

TABLE C-9. CAR 131 - RICH BEST IDLE

1978 CHEVROLET MALIBU CALIFORNIA WITH AIR PUMP

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number,	PVM-ST	131-11	131-12	131-13	131-21	131-22	131-23	131-31	131-32	131-33
Barometer,	mm Hg	738.9	739.1	739.1	743.2	741.2	741.2	739.4	739.4	739.6
Humidity,	g/kg	13.9	9.5	10.0	10.1	9.5	9.5	10.4	9.1	8.8
Temperature,	°C	24.4	24.4	25.0	24.4	26.1	26.1	25.6	23.9	24.4
Total Fuel Sulfur,	mg/km	35.94	28.57	24.26	39.27	31.47	26.73	39.53	31.95	27.15
Avg. Exh. Oxygen,	%	5.50	4.45	4.30	3.30	3.15	3.80	3.25	2.85	3.65
Catalyst Avg. Temp.,	°C	495.	613.	597.	604.	700.	637.	600.	705.	632.
Catalyst Max. Temp.,	°C	593.	691.	648.	726.	752.	713.	713.	761.	708.
Carbon Dioxide,	g/km	406.1	322.8	276.1	438.8	353.6	302.1	441.6	358.2	306.8
Fuel Cons.,	ℓ/100 km	17.49	13.90	11.80	18.98	15.21	12.92	19.10	15.44	13.12
Regulated Emissions										
Hydrocarbons (THC),	g/km	0.18	0.06	0.05	0.17	0.02	0.04	0.18	0.03	0.04
Carbon Monoxide,	g/km	1.93	1.76	0.18	3.42	1.70	0.29	3.46	2.20	0.34
Oxides of Nitrogen,	g/km	0.50	0.36	0.50	0.34	0.32	0.47	0.35	0.33	0.51
Particulates										
Total Particulates		2.29	4.38	3.86	--	5.74	3.89	--	4.56	--
Sulfate		1.03	2.33	1.35	2.06	2.68	1.64	2.02	2.34	1.48
Sulfate as % cf TFS,	%	0.96	2.72	1.86	1.75	2.84	2.05	1.70	2.44	1.82
Compound Group Totals										
Aldehydes & Ketones		1.4	1.8	2.1	5.9	4.6	2.6	2.6	1.0	2.1
Individual Hydrocarbons		85.2	39.1	34.8	--	--	--	--	--	--
Organic Sulfides		0.26	0.29	0.18	0.22	0.11	0.11	--	--	--
Organic Amines		0.00	0.00	0.00	0.06	0.03	0.07	0.05	0.05	0.02
Other Compounds										
Ammonia		2.51	1.76	0.89	4.24	2.15	1.01	1.98	1.70	1.18
Cyanide & Cyanogen		0.06	0.00	0.10	0.33	0.04	0.23	0.21	0.10	0.14
DMNA		--	--	--	--	--	--	--	--	--
Hydrogen Sulfide		0.00	0.00	0.00	0.00	0.18	0.00	0.00	1.42	0.00
Nickel Carbonyl		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrous Oxide		5.12	2.99	2.27	1.56	1.45	1.70	2.58	1.92	2.03

TABLE C-9. CAR 131 - RICH BEST IDLE (cont'd)
1978 CHEVROLET MALIBU CALIFORNIA WITH AIR PUMP

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	131-11	131-12	131-13	131-21	131-22	131-23	131-31	131-32	131-33
Aldehydes and Ketones									
Formaldehyde	1.09	0.52	0.89	1.39	0.29	0.48	0.85	0.31	0.83
Acetaldehyde	0.10	0.50	0.53	2.07	0.81	0.48	0.59	0.00	0.00
Acetone	0.00	0.50	0.29	0.53	2.62	0.27	0.00	0.00	0.00
Isobutyraldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone	0.18	0.24	0.30	0.79	0.50	0.87	0.48	0.28	0.48
Crotonaldehyde	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.00	0.00	0.05	1.10	0.34	0.47	0.64	0.36	0.80
Benzaldehyde	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	1.4	1.8	2.1	5.9	4.6	2.6	2.6	1.0	2.1
Total as % of THC, %	0.8	3.0	4.2	3.5	23.0	6.5	1.4	3.3	5.3
Individual Hydrocarbons									
Methane	46.15	32.45	25.20	--	23.85	20.68	63.47	11.17	25.48
Ethylene	12.67	2.58	4.60	--	1.94	3.27	18.68	0.56	3.98
Ethane	8.86	3.72	4.36	--	1.69	2.78	5.24	0.71	3.16
Acetylene	1.04	0.00	0.00	--	0.00	0.00	2.70	0.00	0.00
Propane	0.70	0.38	0.62	--	--	--	--	--	--
Propylene	3.72	0.00	0.00	--	--	--	--	--	--
Benzene	4.44	0.00	0.00	--	1.72	0.49	9.99	0.17	0.67
Toluene	7.66	0.00	0.00	--	5.12	2.64	20.36	0.00	2.36
Total Individual HC	85.2	39.1	34.8	--	--	--	--	--	--
Total as % of THC, %	47.4	65.2	69.6	--	--	--	--	--	--
Organic Sulfides									
Carbonyl Sulfide	0.04	0.00	0.00	0.00	0.00	0.00	--	--	--
Methyl Sulfide	0.04	0.07	0.04	0.04	0.00	0.04	--	--	--
Ethyl Sulfide	0.18	0.21	0.14	0.18	0.11	0.07	--	--	--
Methyl Disulfide	0.00	0.00	0.00	0.00	0.00	0.00	--	--	--
Organic Amines									
Monomethylamine	0.00	0.00	0.00	0.01	0.00	0.03	0.00	0.01	0.00
Monoethylamine	0.00	0.00	0.00	0.05	0.03	0.04	0.05	0.04	0.02
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE C-9. CAR 131 - RICH BEST IDLE (Cont'd)
1978 CHEVROLET MALIBU CALIFORNIA WITH AIR PUMP

		EMISSION RATE, MG/KM (Except at Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		131-11	131-12	131-13	131-21	131-22	131-23	131-31	131-32	131-33
Other Elements										
Chromium	Cr						No			
Lead	Pb						Data			
Manganese	Mn						for			
Arsenic	As						this			
Mercury	Hg						test			
Bromine	Br									
Phosphorus	P									
Silicon	Si									
Cadmium	Cd									
Aluminum	Al	0.01	0.01		0.02	0.01		0.01		
Sulfur	S	0.20	1.00	0.62	0.60	1.12		0.74	1.00	0.58
Sodium	Na									
Fluorine	F									
Magnesium	Mg									
Potassium	K									
Chlorine	Cl									
Platinum	Pt									
Zinc	Zn									
Copper	Cu									
Nickel	Ni									
Iron	Fe	0.08	0.02		0.31	0.04		0.04	0.03	
Vanadium	V									
Titanium	Ti									
Barium	Ba		0.01	0.01	0.01	0.01			0.01	
Calcium	Ca									

TABLE C-10. CAR 132 - 12 PERCENT IGNITION MISFIRE
1978 CHEVROLET MALIBU CALIFORNIA WITH AIR PUMP

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	132-11	132-12	132-13	132-21	132-22	132-23	132-31	132-32	132-33
Barometer, mm Hg	743.2	742.7	742.7	743.7	743.7	743.7	745.0	744.7	744.7
Humidity, g/kg	10.0	8.4	9.0	10.6	9.1	7.5	10.8	8.2	8.7
Temperature, °C	21.7	22.2	25.6	21.7	22.2	24.4	22.8	22.8	24.4
Total Fuel Sulfur, mg/km	37.56	28.26	24.25	38.47	29.50	25.24	37.88	29.14	24.83
Avg. Exh. Oxygen, %	5.08	4.66	4.23	5.21	4.58	4.28	5.15	4.77	4.34
Catalyst Avg. Temp., °C	482.	572.	615.	587.	698.	736.	582.	697.	726.
Catalyst Max. Temp., °C	584.	661.	661.	713.	827.	800.	708.	809.	796.
Carbon Dioxide, g/km	406.6	308.2	264.7	412.8	321.3	275.3	407.4	317.2	270.8
Fuel Cons., ℓ/100 km	17.53	13.19	11.32	17.95	13.77	11.78	17.67	13.60	11.59
Regulated Emissions									
Hydrocarbons, (THC), g/km	0.20	0.05	0.04	1.28	0.15	0.08	0.96	0.16	0.09
Carbon Monoxide, g/km	2.16	0.37	0.22	2.36	0.51	0.22	2.30	0.51	0.25
Oxides of Nitrogen, g/km	0.43	0.35	0.38	0.70	0.50	0.56	0.71	0.52	0.55
Particulates									
Total Particulates	2.79	3.13	3.26	2.83	2.95	1.58	8.26	4.83	2.08
Sulfate	0.88	3.82	3.47	0.76	1.90	1.29	2.78	3.65	3.07
Sulfate as % of TFS, %	0.78	4.51	4.77	0.66	2.15	1.70	2.45	4.18	4.12
Compound Group Totals									
Aldehydes & Ketones	2.3	1.1	1.3	6.2	0.1	1.8	7.5	2.7	6.4
Individual Hydrocarbons	136.	20.	21.	--	--	--	--	--	--
Organic Sulfides	0.11	0.07	0.12	0.21	0.14	0.24	0.54	0.14	0.00
Organic Amines	0.03	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00
Other Compounds									
Ammonia	3.71	--	--	2.65	--	--	2.28	--	--
Cyanide & Cyanogen	0.10	0.00	0.14	0.09	0.05	0.00	0.16	0.13	0.14
DMNA	0.11	--	--	0.00	--	--	0.00	--	--
Hydrogen Sulfide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nickel Carbonyl	--	--	--	--	--	--	--	--	--
Nitrous Oxide	5.	3.	3.	5.	3.	2.	6.	3.	3.

TABLE C-10.CAR 132 - 12 PERCENT IGNITION MISFIRE (CONT'D)
1978 CHEVROLET MALIBU CALIFORNIA WITH AIR PUMP

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	132-11	132-12	132-13	132-21	132-22	123-23	132-31	132-32	132-33
Aldehydes and Ketones									
Formaldehyde	1.67	0.57	0.60	3.95	0.00	1.61	4.99	2.05	4.07
Acetaldehyde	0.35	0.33	0.54	1.77	0.00	0.00	1.70	0.31	1.82
Acetone	0.00	0.00	0.00	0.22	0.00	0.00	0.69	0.27	0.41
Isobutyraldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone	0.00	0.00	0.00	0.08	0.05	0.14	0.00	0.00	0.00
Crotonaldehyde	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.23	0.21	0.18	0.13	0.00	0.09	0.07	0.07	0.10
Benzaldehyde	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	2.3	1.1	1.3	6.2	0.1	1.8	7.5	2.7	6.4
Total as % of THC, %	1.2	2.2	3.3	0.5	0.1	2.3	0.8	1.7	7.1
Individual Hydrocarbons									
Methane	80.	17.	17.	--	--	--	--	--	--
Ethylene	20.	1.	2.	--	--	--	--	--	--
Ethane	12.	2.	2.	--	--	--	--	--	--
Acetylene	0.	0.	0.	--	--	--	--	--	--
Propane	--	--	--	--	--	--	--	--	--
Propylene	6.	0.	0.	--	--	--	--	--	--
Benzene	6.	0.	0.	--	--	--	--	--	--
Toluene	12.	0.	0.	--	--	--	--	--	--
Total Individual HC	136.	20.	21.	--	--	--	--	--	--
Total as % of THC, %	68.	40.	53.	--	--	--	--	--	--
Organic Sulfides									
Carbonyl Sulfide	0.04	0.06	0.02	0.20	0.00	0.03	0.24	0.01	0.00
Methyl Sulfide	0.02	<0.01	0.05	0.01	0.11	0.08	0.29	0.09	0.00
Ethyl Sulfide	0.05	0.00	0.05	0.00	0.03	0.12	0.01	0.04	0.00
Methyl Disulfide	0.00	0.00	0.00	0.00	0.00	<0.01	0.00	0.00	0.00
Organic Amines									
Monomethylamine	0.01	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00
Monoethylamine	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE C-10. CAR 132 - 12 PERCENT IGNITION MISFIRE (Cont'd)
1978 CHEVROLET MALIBU CALIFORNIA WITH AIR PUMP

		EMISSION RATE, MG/KM (Except at Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		132-11	132-12	132-13	132-21	132-22	132-23	132-31	132-32	132-33
Other Elements										
Chromium	Cr									
Lead	Pb *	--	--	--	--	--	--	--	--	--
Manganese	Mn									
Arsenic	As									
Mercury	Hg									
Bromine	Br									
Phosphorus	P									
Silicon	Si			0.01	0.01			0.01		
Cadmium	Cd									
Aluminum	Al	0.02	0.01		0.04	0.01		0.04	0.01	
Sulfur	S	0.30	1.55	1.64	0.37	0.77	0.50	1.29	1.49	1.29
Sodium	Na									
Fluorine	F									
Magnesium	Mg									
Potassium	K									
Chlorine	Cl				0.12	0.01		0.02		
Platinum	Pt									
Zinc	Zn				0.02					
Copper	Cu				0.03					
Nickel	Ni				0.07			0.05		
Iron	Fe				0.43			0.44	0.10	0.03
Vanadium	V									
Titanium	Ti									
Barium	Ba	0.01	0.01	0.01	0.01			0.02	0.01	
Calcium	Ca				0.02			0.02		

* Blank filter had high Pb

TABLE C-11. CAR 133 - DISABLED EGR
1978 CHEVROLET MALIBU CALIFORNIA WITH AIR PUMP

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	133-11	133-12	133-13	133-21	133-22	133-23	133-31	133-32	133-33
Barometer, mm Hg	744.5	744.0	744.0	741.7	740.4	742.2	741.2	742.2	742.2
Humidity, g/kg	8.9	10.4	9.9	10.0	9.2	8.7	9.8	7.7	9.4
Temperature, °C	25.6	25.6	26.7	23.3	26.7	26.1	22.2	23.9	26.1
Total Fuel Sulfur, mg/km	37.77	29.99	25.84	33.19	25.22	20.98	31.93	24.69	21.20
Avg. Exh. Oxygen, %	5.41	4.94	4.21	5.55	5.04	4.96	5.24	5.35	5.08
Catalyst Avg. Temp., °C	--	604.	623.	--	506.	518.	419.	512.	542.
Catalyst Max. Temp., °C	601.	699.	704.	--	610.	584.	512.	606.	584.
Carbon Dioxide, g/km	409.7	327.2	281.9	360.0	275.6	229.2	346.1	269.7	231.6
Fuel Cons., ℓ/100 km	17.62	14.00	12.06	15.49	11.77	9.79	14.90	11.52	9.89
Regulated Emissions									
Hydrocarbons, (THC), g/km	0.19	0.04	0.04	0.15	0.03	0.03	0.15	0.03	0.03
Carbon Monoxide, g/km	1.66	0.37	0.27	1.55	0.06	0.02	1.60	0.06	0.03
Oxides of Nitrogen, g/km	0.40	0.36	0.44	1.45	1.45	1.74	1.34	1.31	1.81
Particulates									
Total Particulates	3.35	4.45	2.35	2.75	42.36	18.81	3.45	16.79	16.62
Sulfate	0.41	1.72	2.59	0.66	25.90	15.35	0.24	7.99	12.26
Sulfate as % of TFS, %	0.36	1.91	3.34	0.66	34.23	24.39	0.25	10.79	19.28
Compound Group Totals									
Aldehydes & Ketones	1.9	0.9	0.3	5.1	2.3	5.9	5.4	3.2	6.1
Individual Hydrocarbons	91.	22.	33.	51.	16.	18.	71.7	14.0	10.0
Organic Sulfides	0.10	0.01	0.01	0.27	0.03	0.00	--	0.02	0.00
Organic Amines	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00
Other Compounds									
Ammonia	9.34	1.72	3.29	3.58	--	--	0.39	--	--
Cyanide & Cyanogen	0.21	0.11	0.06	0.23	0.09	0.06	0.16	0.08	0.04
DMNA	--	--	--	--	--	--	0.00	--	--
Hydrogen Sulfide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nickel Carbonyl	--	--	--	--	--	--	--	--	--
Nitrous Oxide	4.	3.	2.	9.	5.	7.	11.	3.	6.

TABLE C-11. CAR 133 - DISABLED EGR (CONT'D)
1978 CHEVROLET MALIBU CALIFORNIA WITH AIR PUMP

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	133-11	133-12	133-13	133-21	133-22	133-23	133-31	133-32	133-33
Aldehydes and Ketones									
Formaldehyde	1.74	0.40	0.29	5.05	2.25	4.59	4.79	2.11	4.49
Acetaldehyde	0.19	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acetone	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.03	0.14
Isobutyraldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.17	0.07
Crotonaldehyde	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.00	0.00	0.00	0.00	0.00	1.33	0.34	0.93	1.37
Benzaldehyde	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	1.9	0.9	0.3	5.1	2.3	5.9	5.4	3.2	6.1
Total as % of THC, %	1.0	2.2	0.9	3.4	7.7	19.7	3.6	10.8	20.2
Individual Hydrocarbons									
Methane	54.	16.	24.	29.	9.	8.	23.85	5.53	4.15
Ethylene	10.	2.	2.	5.	1.	1.	11.62	0.19	0.48
Ethane	10.	2.	2.	5.	1.	1.	4.91	0.83	0.74
Acetylene	1.	0.	0.	0.	0.	0.	2.28	0.00	0.00
Propane	1.	0.	1.	0.	0.	0.	0.19	0.18	0.15
Propylene	3.	0.	0.	2.	0.	0.	4.35	0.00	0.00
Benzene	4.	0.	1.	3.	1.	1.	6.34	1.05	0.65
Toluene	8.	0.	3.	7.	4.	7.	18.14	6.22	3.84
Total Individual HC	91.	22.	33.	51.	16.	18.	71.7	14.0	10.0
Total as % of THC, %	48.	55.	83.	34.	53.	47.	47.8	46.7	33.3
Organic Sulfides									
Carbonyl Sulfide	0.00	0.00	0.00	0.09	0.02	0.00	--	0.00	0.00
Methyl Sulfide	0.09	0.01	0.01	0.17	0.01	0.00	--	0.02	0.00
Ethyl Sulfide	0.01	0.00	0.00	<0.01	0.00	0.00	--	0.00	0.00
Methyl Disulfide	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
Organic Amines									
Monomethylamine	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00
Monoethylamine	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE C-11. CAR 133 - DISABLED EGR (Cont'd)
1978 CHEVROLET MALIBU CALIFORNIA WITH AIR PUMP

		EMISSION RATE, MG/KM (Except at Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		133-11	133-12	133-13	133-21	133-22	133-23	133-31	133-32	133-33
Other Elements										
Chromium	Cr						No Data for this test			
Lead	Pb		0.60							
Manganese	Mn									
Arsenic	As									
Mercury	Hg									
Bromine	Br		0.50							
Phosphorus	P								0.01	
Silicon	Si	0.01							0.01	0.01
Cadmium	Cd									
Aluminum	Al	0.01	0.01		0.01	0.01		0.01		
Sulfur	S	0.14	0.72	1.09	0.26	7.94		0.07	3.16	4.48
Sodium	Na									
Fluorine	F									
Magnesium	Mg									
Potassium	K									0.01
Chlorine	Cl	0.01	0.01							
Platinum	Pt									
Zinc	Zn									0.03
Copper	Cu									
Nickel	Ni									
Iron	Fe	0.05						0.02		
Vanadium	V									
Titanium	Ti									
Barium	Ba	0.02	0.01	0.01	0.01	0.01		0.01	0.01	0.03
Calcium	Ca	0.05						0.01		

TABLE C-12. CAR 135 - NO AIR INJ. + R.B.I.
1978 CHEVROLET MALIBU - CALIFORNIA

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	135-11	135-12	135-13	135-21	135-22	135-23	135-31	135-32	135-33
Barometer, mm Hg	744.7	745.5	745.5	742.4	742.2	742.2	743.2	743.7	743.7
Humidity, g/kg	10.4	8.3	7.4	10.9	8.4	7.6	9.3	8.8	9.0
Temperature, °C	22.2	23.9	24.4	22.8	22.2	22.8	21.7	24.4	23.9
Total Fuel Sulfur, mg/km	36.48	28.30	23.60	38.43	28.06	23.82	38.09	28.42	23.75
Avg. Exh. Oxygen, %	5.03	4.68	4.37	0.89	0.63	0.31	0.88	0.59	0.38
Catalyst Avg. Temp., °C	485.	601.	613.	417.	532.	608.	423.	538.	617.
Catalyst Max. Temp., °C	593.	708.	674.	525.	668.	669.	525.	674.	678.
Carbon Dioxide, g/km	393.8	308.5	257.6	332.9	266.9	244.9	329.5	273.3	244.9
Fuel Cons., ℓ/100 km	17.02	13.21	11.01	17.93	13.09	11.12	17.77	13.26	11.08
Regulated Emissions									
Hydrocarbons, (THC), g/km	0.17	0.04	0.03	1.23	0.49	0.17	1.25	0.46	0.15
Carbon Monoxide, g/km	2.88	0.49	0.18	53.08	24.37	9.56	52.78	22.90	9.04
Oxides of Nitrogen, g/km	0.37	0.33	0.37	0.28	0.24	0.23	0.27	0.26	0.28
Particulates									
Total Particulates	5.24	6.67	6.90	12.56	4.40	1.96	18.06	9.38	6.64
Sulfate	0.60	3.12	2.95	0.32	0.10	0.16	1.14	0.05	0.06
Sulfate as % of TFS, %	0.55	3.67	4.17	0.28	0.13	0.22	1.00	0.06	0.08
Compound Group Totals									
Aldehydes & Ketones	0.3	0.2	0.6	15.5	5.4	3.5	7.5	6.1	1.9
Individual Hydrocarbons	--	--	--	--	--	--	--	--	--
Organic Sulfides	0.49	0.00	0.00	0.21	2.17	0.43	0.25	1.94	1.62
Organic Amines	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00
Other Compounds									
Ammonia	5.85	--	--	9.21	--	--	15.78	--	--
Cyanide & Cyanogen	0.02	0.00	0.00	1.65	0.60	0.06	1.49	0.78	0.51
DMNA	--	--	--	0.23	--	--	0.08	--	--
Hydrogen Sulfide	0.00	0.00	0.00	0.13	3.66	0.25	0.10	4.86	1.98
Nickel Carbonyl	--	--	--	--	--	--	--	--	--
Nitrous Oxide	5.	3.	2.	6.	4.	3.	7.	2.	3.

TABLE C-12. CAR 135 - NO AIR INJ. + R.B.I. (CONT'D)
1978 CHEVROLET MALIBU - CALIFORNIA

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	135-11	135-12	135-13	135-21	135-22	135-23	135-31	135-32	135-33
Aldehydes and Ketones									
Formaldehyde	0.31	0.16	0.56	1.91	0.47	0.38	1.18	0.56	0.54
Acetaldehyde	0.00	0.00	0.00	4.64	1.96	1.46	2.27	2.54	1.35
Acetone	0.00	0.00	0.00	3.25	1.10	0.62	1.02	0.83	0.00
Isobutyraldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone	0.00	0.00	0.00	5.09	1.45	0.36	3.00	2.11	0.00
Crotonaldehyde	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.00	0.00	0.00	0.63	0.41	0.63	0.06	0.07	0.00
Benzaldehyde	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	0.3	0.2	0.6	15.5	5.4	3.5	7.5	6.1	1.9
Total as % of THC, %	0.2	0.5	2.0	1.3	1.1	2.1	0.6	1.3	1.3
Individual Hydrocarbons									
Methane	--	--	--	--	--	--	--	--	--
Ethylene	--	--	--	--	--	--	--	--	--
Ethane	--	--	--	--	--	--	--	--	--
Acetylene	--	--	--	--	--	--	--	--	--
Propane	--	--	--	--	--	--	--	--	--
Propylene	--	--	--	--	--	--	--	--	--
Benzene	--	--	--	--	--	--	--	--	--
Toluene	--	--	--	--	--	--	--	--	--
Total Individual HC	--	--	--	--	--	--	--	--	--
Total as % of THC, %	--	--	--	--	--	--	--	--	--
Organic Sulfides									
Carbonyl Sulfide	0.41	0.00	0.00	0.20	2.16	0.41	0.24	1.89	1.58
Methyl Sulfide	0.08	0.00	0.00	0.01	<0.01	0.00	0.01	0.04	0.01
Ethyl Sulfide	0.00	0.00	0.00	0.00	0.00	< 0.01	0.00	0.00	0.00
Methyl Disulfide	0.00	0.00	0.00	0.00	0.00	< 0.01	0.00	<0.01	0.03
Organic Amines									
Monomethylamine	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00
Monoethylamine	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE C-12. CAR 135 - NO AIR INJ. + R.B.I. (Cont'd)
1978 CHEVROLET MALIBU - CALIFORNIA

		EMISSION RATE, MG/KM (Except at Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		135-11	135-12	135-13	135-21	135-22	135-23	135-31	135-32	135-33
Other Elements										
Chromium	Cr									
Lead	Pb									
Manganese	Mn									
Arsenic	As									
Mercury	Hg									
Bromine	Br									
Phosphorus	P									
Silicon	Si									
Cadmium	Cd									
Aluminum	Al	0.03	0.01		0.02			0.02	0.01	
Sulfur	S	0.20	1.25	1.28		0.02		0.01	0.03	0.02
Sodium	Na									
Fluorine	F									
Magnesium	Mg									
Potassium	K									
Chlorine	Cl									
Platinum	Pt									
Zinc	Zn									
Copper	Cu									
Nickel	Ni									
Iron	Fe	0.03						0.02		
Vanadium	V									
Titanium	Ti									
Barium	Ba		0.01			0.01	0.01	0.01	0.01	
Calcium	Ca									

TABLE C-13. CAR 141 - RICH BEST IDLE
1978 FORD GRANADA - 49 STATE WITH AIR PUMP

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	141-11	141-2	141-13	141-21	141-22	141-23	141-31	141-32	141-33
Barometer, mm Hg	741.2	740.9	740.9	740.2	739.6	739.6	739.9	739.4	733.6
Humidity, g/kg	9.3	9.2	10.2	10.2	8.8	10.0	11.2	10.7	11.3
Temperature, °C	23.3	25.0	26.1	24.4	24.4	23.3	23.9	23.3	25.6
Total Fuel Sulfur, mg/km	34.11	26.19	24.36	36.17	27.19	24.05	37.44	27.17	22.76
Avg. Exh. Oxygen, %	5.70	4.55	3.20	4.95	3.90	3.15	4.45	3.70	3.15
Catalyst Avg. Temp., °C	--	--	--	554.	589.	547.	557.	564.	552.
Catalyst Max. Temp., °C	--	--	--	657.	699.	639.	666.	657.	636.
Carbon Dioxide, g/km	369.0	285.3	265.0	362.6	290.6	259.7	376.3	289.4	246.3
Fuel Cons., ℓ/100 km	15.92	12.22	11.37	16.88	12.69	11.22	17.47	12.68	10.62
Regulated Emissions									
Hydrocarbons, (THC), g/km	0.30	0.11	0.11	0.63	0.15	0.16	0.61	0.17	0.13
Carbon Monoxide, g/km	1.88	0.46	0.62	19.60	3.94	1.79	19.79	4.52	1.33
Oxides of Nitrogen, g/km	0.96	0.88	0.89	0.60	0.67	0.85	0.64	0.69	0.82
Particulates									
Total Particulates	8.61	2.73	4.59	2.97	2.68	1.73	2.97	1.23	1.19
Sulfate	0.80	0.92	2.01	0.22	0.12	0.15	0.33	0.13	0.25
Sulfate as % of TFS, %	0.78	1.17	2.75	0.20	0.15	0.21	0.29	0.16	0.37
Compound Group Totals									
Aldehydes & Ketones	2.0	1.6	1.1	2.4	0.8	1.0	2.5	1.5	1.9
Individual Hydrocarbons	104.5	42.0	59.1	285.7	99.0	52.7	314.6	110.7	66.1
Organic Sulfides	0.15	0.13	0.07	0.02	0.00	0.01	0.04	0.08	0.08
Organic Amines	0.01	0.00	0.00	0.02	0.05	0.02	0.13	0.03	0.00
Other Compounds									
Ammonia	1.67	0.77	0.76	11.44	14.67	5.57	31.35	12.30	3.53
Cyanide & Cyanogen	0.01	0.04	0.06	0.82	0.01	0.09	1.13	0.10	0.00
DMNA	--	--	--	--	--	--	--	--	--
Hydrogen Sulfide	0.00	0.00	0.00	0.25	0.59	0.00	0.26	0.13	0.00
Nickel Carbonyl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrous Oxide	19.22	7.14	4.82	9.93	5.11	2.96	9.58	5.82	3.75

TABLE C-13. CAR 141 - RICH BEST IDLE (Cont'd)
1978 FORD GRANADA - 49 STATE WITH AIR PUMP

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	141-11	141-12	141-13	141-21	141-22	141-23	141-31	141-32	141-33
Aldehydes and Ketones									
Formaldehyde	0.91	1.09	0.52	1.31	0.58	0.82	1.34	0.92	0.49
Acetaldehyde	0.51	0.37	0.25	0.76	0.00	0.00	0.49	0.29	0.00
Acetone	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.09	0.00
Isobutyraldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.37
Methyl Ethyl Ketone	0.24	0.04	0.16	0.00	0.00	0.00	0.14	0.08	0.00
Crotonaldehyde	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.31	0.10	0.15	0.29	0.19	0.17	0.22	0.08	0.00
Benzaldehyde	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	2.0	1.6	1.1	2.4	0.8	1.0	2.5	1.5	1.9
Total as % of THC, %	0.7	1.5	1.0	0.4	0.5	0.6	0.5	0.9	1.5
Individual Hydrocarbons									
Methane	33.81	18.12	23.54	135.06	57.63	26.99	132.02	61.05	33.56
Ethylene	15.75	5.31	4.66	34.91	6.06	3.15	39.04	12.85	6.66
Ethane	16.86	10.18	11.97	17.97	10.09	10.70	18.50	12.28	11.33
Acetylene	1.47	0.00	0.00	0.97	0.00	0.00	0.65	0.00	0.19
Propane	0.63	0.49	0.79	1.91	0.90	1.10	2.39	1.39	1.03
Propylene	7.23	1.92	3.50	11.53	2.15	1.36	13.03	3.58	2.36
Benzene	6.06	0.00	7.36	65.39	18.69	3.83	71.49	14.34	4.87
Toluene	22.71	5.94	7.32	17.98	3.47	5.58	37.44	5.25	6.07
Total Individual HC	104.5	42.0	59.1	285.7	99.0	52.7	314.6	110.7	66.1
Total as % of THC, %	34.8	38.1	53.8	45.4	66.0	32.9	51.6	65.1	50.8
Organic Sulfides									
Carbonyl Sulfide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Sulfide	0.04	0.02	0.00	0.01	0.00	0.01	0.04	0.04	0.07
Ethyl Sulfide	0.11	0.11	0.07	0.01	0.00	0.00	0.00	0.04	<0.01
Methyl Disulfide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Organic Amines									
Monomethylamine	0.01	0.00	0.00	0.01	0.02	0.00	0.10	0.02	0.00
Monoethylamine	0.00	0.00	0.00	0.01	0.03	0.02	0.03	0.01	0.00
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE C-13. CAR 141 - RICH BEST IDLE (Cont'd)
1978 FORD GRANADA - 49 STATE WITH AIR PUMP

		EMISSION RATE, MG/KM (Except at Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		141-11	141-12	141-13	141-21	141-22	141-23	141-31	141-32	141-33
Other Elements										
Chromium	Cr									
Lead	Pb	0.41								
Manganese	Mn	0.01								
Arsenic	As									
Mercury	Hg									
Bromine	Br	0.15								
Phosphorus	P	0.05	0.01		0.01	0.01		0.01		
Silicon	Si									
Cadmium	Cd									
Aluminum	Al	0.02								
Sulfur	S	0.28	0.36	0.87	0.02	0.02	0.04	0.02	0.02	0.05
Sodium	Na									
Fluorine	F									
Magnesium	Mg	0.02	0.01			0.01			0.01	
Potassium	K									
Chlorine	Cl	0.03			0.01	0.02		0.01		
Platinum	Pt									
Zinc	Zn	0.03								
Copper	Cu									
Nickel	Ni									
Iron	Fe	1.38	0.11	0.05	0.19	0.11		0.11	0.02	
Vanadium	V									
Titanium	Ti									
Barium	Ba	0.06	0.02	0.02	0.01	0.02	0.02	0.01	0.02	0.02
Calcium	Ca	0.01				0.01		0.04		

TABLE C-14. CAR 142 - TWELVE PERCENT MISFIRE
1978 FORD GRANADA - 49 STATE WITH AIR PUMP

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	142-11	142-12	142-13	142-21	142-22	142-23	142-31	142-32	142-33
Barometer, mm Hg	743.5	743.7	743.7	741.7	742.7	742.7	742.4	742.7	742.7
Humidity, g/kg	10.9	9.0	8.1	11.1	9.1	9.7	11.1	9.1	8.6
Temperature, °C	22.8	23.9	24.4	22.2	22.2	23.9	22.2	22.2	23.3
Total Fuel Sulfur, mg/km	32.02	25.38	21.82	34.70	27.00	23.42	34.14	26.88	23.41
Avg. Exh. Oxygen, %	4.90	4.35	3.29	4.91	4.19	3.15	4.94	4.18	3.06
Catalyst Avg. Temp., °C	371.	448.	487.	504.	599.	633.	503.	593.	631.
Catalyst Max. Temp., °C	461.	533.	538.	610.	691.	695.	639.	678.	687.
Carbon Dioxide, g/km	347.4	276.8	238.1	371.1	292.8	254.3	364.7	291.4	254.4
Fuel Cons., ℓ/100 km	14.94	11.84	10.18	16.19	12.60	10.93	15.93	12.54	10.92
Regulated Emissions									
Hydrocarbons, (THC), g/km	0.25	0.08	0.06	1.59	0.51	0.39	1.71	0.52	0.38
Carbon Monoxide, g/km	1.20	0.25	0.15	2.02	0.48	0.30	1.98	0.54	0.24
Oxides of Nitrogen, g/km	1.25	0.93	0.77	1.68	1.16	0.99	1.71	1.21	1.09
Particulates									
Total Particulates	5.05	5.93	11.50	10.95	5.56	6.56	14.46	5.53	6.35
Sulfate	0.54	3.68	7.39	--	0.59	0.75	0.32	0.47	0.91
Sulfate as % of TFS, %	0.56	4.83	11.29	--	0.73	1.07	0.31	0.58	1.30
Compound Group Totals									
Aldehydes & Ketones	4.8	2.3	3.3	10.5	8.2	9.5	8.4	6.4	8.4
Individual Hydrocarbons	72.	--	--	--	--	--	--	--	--
Organic Sulfides	0.12	0.00	0.10	0.06	0.01	0.01	0.01	0.04	<0.01
Organic Amines	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.0
Other Compounds									
Ammonia	1.26	--	--	4.71	--	--	2.68	--	--
Cyanide & Cyanogen	0.31	0.00	0.00	0.17	0.00	0.07	0.15	0.06	0.19
DMNA	0.00	--	--	0.00	--	--	0.00	--	--
Hydrogen Sulfide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nickel Carbonyl	--	--	--	--	--	--	--	--	--
Nitrous Oxide	18.	7.	4.	--	--	--	--	--	--

TABLE C-14. CAR 142 - TWELVE PERCENT MISFIRE (CONT'D)
1978 FORD GRANADA - 49 STATE WITH AIR PUMP

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	142-11	142-12	142-13	142-21	142-22	142-23	142-31	142-32	142-33
Aldehydes and Ketones									
Formaldehyde	4.16	1.34	0.55	4.85	4.12	5.80	3.90	3.49	5.40
Acetaldehyde	0.00	0.64	0.00	3.34	2.84	2.70	3.07	1.86	2.24
Acetone	0.15	0.12	2.53	1.63	0.76	0.56	0.71	0.54	0.44
Isobutyraldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00
Methyl Ethyl Ketone	0.27	0.15	0.15	0.53	0.32	0.29	0.44	0.35	0.26
Crotonaldehyde	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.18	0.06	0.09	0.16	0.13	0.18	0.19	0.11	0.07
Benzaldehyde	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	4.8	2.3	3.3	10.5	8.2	9.5	8.4	6.4	8.4
Total as % of THC, %	1.9	2.9	5.5	0.7	1.6	2.4	0.5	1.2	2.2
Individual Hydrocarbons									
Methane	20.	--	--	--	--	--	--	--	--
Ethylene	12.	--	--	--	--	--	--	--	--
Ethane	7.	--	--	--	--	--	--	--	--
Acetylene	0.	--	--	--	--	--	--	--	--
Propane	1.	--	--	--	--	--	--	--	--
Propylene	6.	--	--	--	--	--	--	--	--
Benzene	8.	--	--	--	--	--	--	--	--
Toluene	18.	--	--	--	--	--	--	--	--
Total Individual HC	72.	--	--	--	--	--	--	--	--
Total as % of THC, %	29.	--	--	--	--	--	--	--	--
Organic Sulfides									
Carbonyl Sulfide	0.10	0.00	<0.01	--	0.00	0.00	0.01	0.00	0.00
Methyl Sulfide	0.02	0.00	0.09	0.06	0.01	0.00	0.00	0.03	<0.01
Ethyl Sulfide	0.00	0.00	0.04	0.00	0.00	0.01	0.00	<0.01	0.00
Methyl Disulfide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Organic Amines									
Monomethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Monoethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00
Trimethylamine	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE C-14. CAR 142 - TWELVE PERCENT MISFIRE (Cont'd)
1978 FORD GRANADA - 49 STATE WITH AIR PUMP

		EMISSION RATE, MG/KM (Except at Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		142-11	142-12	142-13	142-21	142-22	142-23	142-31	142-32	142-33
Other Elements										
Chromium	Cr									
Lead	Pb*	--	--	--	--	--	--	--	--	--
Manganese	Mn									
Arsenic	As									
Mercury	Hg									
Bromine	Br									
Phosphorus	P				0.01	0.02		0.02	0.01	0.01
Silicon	Si					0.01	0.01	0.01		0.01
Cadmium	Cd									
Aluminum	Al									
Sulfur	S	0.14	1.38	3.23	0.08	0.20	0.18	0.10	0.19	0.40
Sodium	Na									
Fluorine	F									
Magnesium	Mg				0.01	0.01		0.01	0.01	0.01
Potassium	K									
Chlorine	Cl	0.01			0.01					
Platinum	Pt									
Zinc	Zn				0.02			0.03		
Copper	Cu									
Nickel	Ni									
Iron	Fe	0.15			0.28	0.23	0.04	0.26	0.11	0.10
Vanadium	V									
Titanium	Ti									
Barium	Ba	0.01	0.01	0.02	0.03	0.03	0.02	0.05	0.03	0.03
Calcium	Ca				0.01		0.04			0.01

*Blank filter had high Pb

TABLE C-15. CAR 143 - DISABLED EGR AND AIR PUMP
1978 FORD GRANADA - 49 STATE WITH AIR PUMP

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	143-11	143-12	143-13	143-21	143-22	143-23	143-31	143-32	143-33
Barometer, mm Hg	742.9	739.1	739.1	740.7	739.4	739.4	745.0	744.7	744.7
Humidity, g/kg	9.7	10.7	9.7	9.8	8.8	9.5	8.4	8.6	8.1
Temperature, °C	23.9	25.0	25.6	22.2	24.4	26.1	22.2	23.3	24.4
Total Fuel Sulfur, mg/km	32.41	25.42	22.59	32.22	26.03	23.05	34.31	26.41	22.29
Avg. Exh. Oxygen, %	4.87	4.41	3.28	4.07	3.06	1.62	4.03	3.05	1.72
Catalyst Avg. Temp., °C	--	457.	479.	338.	428.	474.	354.	442.	481.
Catalyst Max. Temp., °C	444.	542.	546.	414.	521.	525.	440.	529.	537.
Carbon Dioxide, g/km	351.4	276.9	246.5	348.2	284.0	251.6	370.8	288.1	243.3
Fuel Cons., ℓ/100 km	15.12	11.86	10.54	15.03	12.15	10.76	16.01	12.32	10.40
Regulated Emissions									
Hydrocarbons, (THC), g/km	0.26	0.09	0.07	0.33	0.08	0.06	0.39	0.07	0.07
Carbon Monoxide, g/km	1.38	0.47	0.16	1.88	0.23	0.15	1.99	0.24	0.08
Oxides of Nitrogen, g/km	1.41	1.04	0.95	4.02	5.05	4.91	4.23	5.22	4.85
Particulates									
Total Particulates	7.34	10.10	23.21	10.70	7.01	9.21	9.65	13.54	16.53
Sulfate	0.34	4.86	14.12	0.33	2.07	4.96	0.18	6.93	13.04
Sulfate as % of TFS, %	0.35	6.37	20.84	0.34	2.65	7.17	0.17	8.75	19.50
Compound Group Totals									
Aldehydes & Ketones	3.0	1.8	1.5	6.3	6.4	8.2	7.9	3.4	3.8
Individual Hydrocarbons	95.	57.7	29.	120.	32.	27.	156.	--	23.
Organic Sulfides	0.07	0.09	0.09	<0.01	0.07	0.02	0.03	0.23	0.03
Organic Amines	0.09	0.00	0.00	0.05	0.00	0.00	0.00	0.01	0.00
Other Compounds									
Ammonia	2.87	--	--	2.57	--	--	4.97	--	--
Cyanide & Cyanogen	0.36	0.03	0.11	1.64	0.11	0.08	1.26	0.01	0.15
DMNA	0.00	--	--	0.04	--	--	0.05	--	--
Hydrogen Sulfide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nickel Carbonyl	--	--	--	--	--	--	--	--	--
Nitrous Oxide	20.	15.	4.	56.89	23.58	12.86	64.09	--	--

TABLE C-15. CAR 143 - DISABLED EGR AND AIR PUMP (CONT'D)
1978 FORD GRANADA - 49 STATE WITH AIR PUMP

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	143-11	143-12	143-13	143-21	143-22	143-23	143-31	143-32	143-33
Aldehydes and Ketones									
Formaldehyde	2.98	1.50	1.33	4.34	4.95	6.51	5.69	1.98	2.48
Acetaldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acetone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Isobutyraldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone	0.00	0.08	0.13	0.00	0.00	0.00	0.00	0.12	0.00
Crotonaldehyde	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.00	0.25	0.06	1.95	1.49	01.68	2.19	1.29	1.28
Benzaldehyde	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	3.0	1.8	1.5	6.3	6.4	8.2	7.9	3.4	3.8
Total as % of THC, %	1.2	2.0	2.2	1.9	8.0	13.7	2.0	4.9	5.4
Individual Hydrocarbons									
Methane	45.	24.98	17.	35.13	15.	15.	39.	17.	15.
Ethylene	4.	6.08	2.	20.31	1.	1.	26.	2.	2.
Ethane	17.	9.36	7.	8.28	8.	5.	13.	4.	4.
Acetylene	0.	0.00	0.	0.65	5.	0.	2.	0.	0.
Propane	1.	0.20	0.	0.00	0.	4.	0.	0.	0.
Propylene	2.	3.21	0.	11.14	0.	0.	14.	0.	0.
Benzene	5.	5.91	1.	12.55	1.	1.	18.	2.	1.
Toluene	21.	7.99	2.	31.91	2.	1.	44.	--	1.
Total Individual HC	95.	57.7	29.	120.0	32.	27.	156.	--	23.
Total as % of THC, %	37.	64.1	41.	36.4	40.	45.	40.	--	33.
Organic Sulfides									
Carbonyl Sulfide	0.03	0.02	0.04	0.00	0.07	0.02	0.02	0.21	0.00
Methyl Sulfide	0.04	0.07	0.05	<0.01	0.00	0.00	0.01	0.01	<0.01
Ethyl Sulfide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02
Methyl Disulfide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Organic Amines									
Monomethylamine	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.01	0.00
Monoethylamine	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE C-15. CAR 143 - DISABLED EGR AND AIR PUMP (Cont'd)
1978 FORD GRANADA - 49 STATE WITH AIR PUMP

		EMISSION RATE, MG/KM (Except at Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		143-11	143-12	143-13	143-21	143-22	143-23	143-31	143-32	143-33
Other Elements										
Chromium	Cr									
Lead	Pb*	--	--	--	--	--	--	--	--	--
Manganese	Mn									
Arsenic	As									
Mercury	Hg									
Bromine	Br									
Phosphorus	P		0.01			0.01			0.01	0.01
Silicon	Si								0.01	
Cadmium	Cd									
Aluminum	Al									
Sulfur	S	0.07	1.67	5.38	0.02	0.76	1.91	0.04	2.67	4.98
Sodium	Na									
Fluorine	F									
Magnesium	Mg					0.01			0.01	
Potassium	K									
Chlorine	Cl									
Platinum	Pt									
Zinc	Zn						0.03			
Copper	Cu		0.05							
Nickel	Ni									
Iron	Fe	0.03	0.02					0.07	0.13	0.09
Vanadium	V									
Titanium	Ti									
Barium	Ba	0.01	0.02	0.03	0.01	0.03	0.02	0.01	0.03	0.03
Calcium	Ca			0.02						

* Blank filter had high Pb

TABLE C-16. CAR 145 - NO AIR INJ. + R.B.I.
1978 FORD GRANADA - 49 STATE

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	145-11	145-12	145-13	145-21	145-22	145-23	145-31	145-32	145-33
Barometer, mm Hg	738.1	738.1	738.1	739.1	739.4	739.4	735.1	738.6	738.6
Humidity, g/kg	12.2	8.9	8.9	11.4	11.6	9.3	10.3	10.7	8.8
Temperature, °C	23.3	22.8	22.8	21.7	22.8	23.3	22.8	23.3	24.4
Total Fuel Sulfur, mg/km	31.96	24.69	21.34	35.20	25.02	22.41	35.10	25.97	21.74
Avg. Exh. Oxygen, %	5.49	4.78	3.38	5.79	4.28	2.21	5.30	4.01	2.24
Catalyst Avg. Temp., °C	392.	483.	520.	351.	437.	504.	358.	463.	513.
Catalyst Max. Temp., °C	482.	572.	572.	459.	533.	546.	461.	558.	558.
Carbon Dioxide, g/km	346.3	269.3	233.	298.8	246.4	239.8	296.4	255.0	232.3
Fuel Cons., ℓ/100 km	14.91	11.52	9.96	16.42	11.68	10.46	16.38	12.12	10.14
Regulated Emissions									
Hydrocarbons, (THC), g/km	0.25	0.07	0.05	2.21	0.80	0.22	2.30	0.84	0.23
Carbon Monoxide, g/km	1.46	0.27	0.05	50.26	15.68	2.85	50.98	16.67	2.90
Oxides of Nitrogen, g/km	1.27	0.92	0.77	0.61	0.70	0.88	0.61	0.69	0.77
Particulates									
Total Particulates	9.20	0.66	3.93	14.31	4.36	1.65	21.50	3.46	1.66
Sulfate	2.90	5.67	10.31	5.26	0.32	0.20	3.90	0.42	0.30
Sulfate as % of TFS, %	3.02	7.65	16.10	4.98	0.43	0.30	3.70	0.54	0.46
Compound Group Totals									
Aldehydes & Ketones	3.9	3.1	1.4	1.1	0.1	0.1	0.7	0.0	0.1
Individual Hydrocarbons	117.	--	--	426.	--	--	--	--	--
Organic Sulfides	--	0.06	0.00	0.51	0.86	1.04	1.06	1.22	0.26
Organic Amines	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Compounds									
Ammonia	--	--	--	--	--	--	--	--	--
Cyanide & Cyanogen	--	--	--	--	--	--	--	--	--
DMNA	0.00	--	--	--	--	--	--	--	--
Hydrogen Sulfide	0.00	0.05	0.02	0.63	2.46	1.54	0.75	3.77	1.30
Nickel Carbonyl	--	--	--	--	--	--	--	--	--
Nitrous Oxide	27.	8.	4.	20.	6.	4.	7.	5.	3.

TABLE C-16. CAR 145 - NO AIR INJ. + R.B.I. (CONT'D)
1978 FORD GRANADA - 49 STATE

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	145-11	145-12	145-13	145-21	145-22	145-23	145-31	145-32	145-33
Aldehydes and Ketones									
Formaldehyde	3.49	1.39	0.99	0.35	0.00	0.00	0.30	0.00	0.00
Acetaldehyde	0.04	0.05	0.23	0.61	0.00	0.00	0.00	0.00	0.00
Acetone	0.04	1.58	0.00	0.00	0.00	0.00	0.07	0.00	0.11
Isobutyraldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone	0.18	0.04	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Crotonaldehyde	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.11	0.06	0.09	0.15	0.11	0.07	0.30	0.00	0.00
Benzaldehyde	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	3.9	3.1	1.4	1.1	0.1	0.1	0.7	0.0	0.1
Total as % of THC, %	1.6	4.4	2.8	0.0	0.0	0.0	0.0	0.0	0.0
Individual Hydrocarbons									
Methane	48.	--	--	114.	--	--	--	--	--
Ethylene	17.	--	--	99.	--	--	--	--	--
Ethane	14.	--	--	43.	--	--	--	--	--
Acetylene	0.	--	--	4.	--	--	--	--	--
Propane	--	--	--	5.	--	--	--	--	--
Propylene	6.	--	--	26.	--	--	--	--	--
Benzene	11.	--	--	48.	--	--	--	--	--
Toluene	21.	--	--	87.	--	--	--	--	--
Total Individual HC	117.	--	--	426.	--	--	--	--	--
Total as % of THC, %	47.	--	--	19.	--	--	--	--	--
Organic Sulfides									
Carbonyl Sulfide	--	0.04	0.00	0.48	0.73	0.85	0.85	1.04	0.20
Methyl Sulfide	--	0.00	0.00	0.02	0.04	0.06	0.07	0.08	0.05
Ethyl Sulfide	--	0.02	0.00	0.01	0.08	0.12	0.13	0.09	0.01
Methyl Disulfide	--	0.00	0.00	0.00	0.01	0.01	0.01	<0.01	0.00
Organic Amines									
Monomethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Monoethylamine	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE C-16. CAR 145 - NO AIR INJ. + R.B.I. (Cont'd)
1978 FORD GRANADA - 49 STATE

		EMISSION RATE, MG/KM (Except at Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		145-11	145-12	145-13	145-21	145-22	145-23	145-31	145-32	145-33
Other Elements										
Chromium	Cr							No Data for this test		
Lead	Pb						0.01			
Manganese	Mn									
Arsenic	As									
Mercury	Hg									
Bromine	Br									
Phosphorus	P	0.01								
Silicon	Si									
Cadmium	Cd									
Aluminum	Al									
Sulfur	S	0.15	1.89	4.06	0.01	0.02	0.04		0.03	0.03
Sodium	Na									
Fluorine	F									
Magnesium	Mg	0.01								
Potassium	K									
Chlorine	Cl	0.02			0.01					
Platinum	Pt									
Zinc	Zn									
Copper	Cu									
Nickel	Ni									
Iron	Fe	0.13	0.06	0.05	0.05	0.02			0.02	
Vanadium	V									
Titanium	Ti									
Barium	Ba	0.03	0.02	0.02		0.01	0.02		0.01	0.01
Calcium	Ca									

TABLE C-17. CAR 151 - RICH BEST IDLE
1978 FORD MUSTANG II - 49 STATE W/O AIR PUMP

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	151-11	151-12	151-13	151-21	151-22	151-23	151-31	151-32	151-33
Barometer, mm Hg	--	740.7	740.7	740.7	740.2	740.2	737.9	736.9	737.9
Humidity, g/kg	--	8.8	9.1	9.9	10.7	9.9	10.5	9.6	9.5
Temperature, °C	--	24.4	23.9	25.0	23.3	26.7	23.9	24.4	26.1
Total Fuel Sulfur, mg/km	--	27.44	25.02	37.56	28.08	24.93	36.24	28.11	24.96
Avg. Exh. Oxygen, %	--	2.95	1.85	3.70	2.55	1.50	3.70	2.60	1.45
Catalyst Avg. Temp., °C	--	542.	--	432.	531.	572.	438.	540.	579.
Catalyst Max. Temp., °C	--	652.	652.	588.	661.	669.	584.	669.	669.
Carbon Dioxide, g/km	--	298.0	272.7	326.8	279.7	266.6	318.0	280.1	267.1
Fuel Cons., ℓ/100 km	--	12.81	11.68	17.52	13.10	11.63	16.91	13.12	11.65
Regulated Emissions									
Hydrocarbons (THC), g/km	--	0.12	0.10	2.29	0.81	0.32	2.19	0.80	0.29
Carbon Monoxide, g/km	--	1.04	0.35	48.73	15.68	3.15	45.33	15.76	3.09
Oxides of Nitrogen, g/km	--	1.00	1.01	0.76	0.86	0.94	0.74	0.77	0.90
Particulates									
Total Particulates	--	3.13	2.32	13.45	2.98	2.27	5.30	2.48	1.95
Sulfate	--	0.41	0.91	0.20	0.14	0.12	0.32	0.15	0.29
Sulfate as % of TFS, %	--	0.50	1.21	0.18	0.17	0.16	0.29	0.18	0.39
Compound Group Totals									
Aldehydes & Ketones	--	0.8	--	4.3	0.8	2.2	4.7	0.9	1.3
Individual Hydrocarbons	--	60.3	51.4	1023.5	366.3	144.4	951.6	401.6	166.8
Organic Sulfides	--	0.08	0.39	0.26	--	--	--	0.02	--
Organic Amines	--	0.01	0.02	0.11	0.04	--	0.11	0.07	0.00
Other Compounds									
Ammonia	--	3.14	2.38	53.86	22.15	5.28	59.42	35.85	11.98
Cyanide & Cyanogen	--	0.03	0.08	6.98	2.04	0.09	5.31	1.93	0.38
DMNA	--	--	--	--	--	--	--	--	--
Hydrogen Sulfide	--	0.02	0.41	0.55	2.00	0.70	0.59	2.73	0.92
Nickel Carbonyl	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrous Oxide	--	19.59	22.03	45.55	20.79	7.35	44.5	23.2	7.30

TABLE C-17. CAR 151 - RICH BEST IDLE (Cont'd)
1978 FORD MUSTANG II - 49 STATE W/O AIR PUMP

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	151-11	151-12	151-13	151-21	151-22	151-23	151-31	151-32	151-33
Aldehydes and Ketones									
Formaldehyde	--	0.77	0.44	2.44	0.36	0.60	2.01	0.45	0.72
Acetaldehyde	--	0.00	0.00	1.23	0.00	1.03	2.52	0.35	0.46
Acetone	--	0.00	19.21	0.39	0.00	0.00	0.00	0.00	0.00
Isobutyraldehyde	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone	--	0.06	0.35	0.03	0.19	0.35	0.00	0.00	0.00
Crotonaldehyde	--	--	--	--	--	--	--	--	--
Hexanaldehyde	--	0.00	0.46	0.24	0.20	0.18	0.18	0.05	0.08
Benzaldehyde	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	--	0.8	20.5	4.3	0.8	2.2	4.7	0.9	1.3
Total as % of THC, %	--	0.7	20.5	0.2	0.1	0.7	0.2	0.1	0.4
Individual Hydrocarbons									
Methane	--	26.67	27.67	265.73	96.51	46.16	249.24	101.14	52.63
Ethylene	--	4.55	2.44	317.72	96.65	24.82	286.03	107.13	29.65
Ethane	--	10.79	10.67	49.26	19.78	12.09	46.86	20.33	11.59
Acetylene	--	0.00	0.00	0.86	0.0	0.0	1.68	0.0	0.00
Propane	--	1.63	2.01	3.99	3.90	1.26	10.86	3.26	5.28
Propylene	--	2.79	1.37	86.01	28.25	10.29	71.63	41.56	11.45
Benzene	--	6.59	2.21	123.84	52.64	22.95	112.89	60.55	28.79
Toluene	--	7.29	5.03	176.13	68.54	26.69	172.41	67.58	27.92
Total Individual HC	--	60.3	51.4	1023.5	366.3	144.4	951.6	401.6	167.3
Total as % of THC, %	--	50.3	51.4	44.7	45.2	45.1	43.5	50.2	57.7
Organic Sulfides									
Carbonyl Sulfide	--	0.00	0.07	0.14	--	--	--	0.00	--
Methyl Sulfide	--	0.04	0.00	0.01	0.02	0.11	0.04	<0.01	0.18
Ethyl Sulfide	--	0.04	0.28	0.04	0.16	0.39	0.35	0.01	0.27
Methyl Disulfide	--	0.00	0.04	0.07	0.18	0.00	0.00	0.00	0.00
Organic Amines									
Monomethylamine	--	0.01	0.01	0.04	0.01	--	0.02	0.02	0.00
Monoethylamine	--	0.00	0.01	0.07	0.03	0.01	0.09	0.05	0.00
Trimethylamine	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE C-17. CAR 151 - RICH BEST IDLE (Cont'd)
1978 FORD MUSTANG II - 49 STATE W/O AIR PUMP

		EMISSION RATE, MG/KM (Except at Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		151-11	151-12	151-13	151-21	151-22	151-23	151-31	151-32	151-33
Other Elements										
Chromium	Cr									
Lead	Pb									
Manganese	Mn	0.01								
Arsenic	As									
Mercury	Hg									
Bromine	Br									
Phosphorus	P	0.03	0.01					0.01	0.01	
Silicon	Si	0.01								
Cadmium	Cd									
Aluminum	Al	0.01								
Sulfur	S	0.11	0.11	0.33	0.03	0.03	0.02	0.01	0.02	0.03
Sodium	Na									
Fluorine	F									
Magnesium	Mg	0.01								
Potassium	K									
Chlorine	Cl	0.05	0.01							
Platinum	Pt									
Zinc	Zn	0.02								
Copper	Cu									
Nickel	Ni									
Iron	Fe	.73	0.11	0.03	0.21	0.09	0.04	0.09	0.05	0.03
Vanadium	V									
Titanium	Ti									
Barium	Ba	0.03	0.02		0.01	0.02		0.01	0.02	
Calcium	Ca									

TABLE C-18. CAR 152 - 12 PERCENT IGNITION MISFIRE
1978 FORD MUSTANG II - 49 STATE W/O AIR PUMP

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	152-11	152-12	152-13	152-21	152-22	152-23	152-31	152-32	152-33
Barometer, mm Hg	741.4	741.4	741.4	743.5	740.7	740.7	739.9	739.9	739.9
Humidity, g/kg	8.8	8.8	11.1	9.3	14.2	18.4	10.0	10.9	7.5
Temperature, °C	24.4	26.1	27.2	21.7	25.6	27.8	23.3	22.8	24.4
Total Fuel Sulfur, mg/km	32.30	25.86	24.19	35.64	27.22	24.86	36.08	26.72	24.34
Avg. Exh. Oxygen, %	3.80	3.09	1.21	3.07	2.81	1.58	3.62	2.91	1.69
Catalyst Avg. Temp., °C	470.	569.	623.	525.	693.	738.	600.	681.	731.
Catalyst Max. Temp., °C	601.	661.	696.	734.	782.	787.	726.	769.	787.
Carbon Dioxide, g/km	348.2	281.5	263.7	378.3	292.5	270.2	383.3	288.1	264.6
Fuel Cons., ℓ/100 km	15.07	12.07	11.29	16.63	12.70	11.60	16.83	12.47	11.36
Regulated Emissions									
Hydrocarbons, (THC), g/km	0.29	0.10	0.07	1.59	0.53	0.29	1.62	0.47	0.28
Carbon Monoxide, g/km	2.56	0.58	0.37	4.03	2.16	0.44	3.81	1.62	0.38
Oxides of Nitrogen, g/km	1.02	0.95	0.93	1.28	1.39	1.73	1.23	1.23	1.05
Particulates									
Total Particulates	3.32	1.62	1.39	5.59	2.81	1.24	8.71	2.85	1.50
Sulfate	0.51	0.37	0.09	0.11	0.03	0.03	0.17	0.07	0.05
Sulfate as % of TFS, %	0.53	0.48	0.12	0.10	0.04	0.04	0.16	0.09	0.07
Compound Group Totals									
Aldehydes & Ketones	3.2	0.6	0.9	4.8	1.8	5.3	4.1	2.2	6.4
Individual Hydrocarbons	122.4	55.	28.	151.	83.	65.	146.	--	--
Organic Sulfides	0.26	0.54	0.19	0.24	0.30	0.18	0.18	--	0.07
Organic Amines	0.01	0.02	0.21	0.02	0.02	0.01	0.00	0.00	0.00
Other Compounds									
Ammonia	3.52	--	--	10.19	--	--	8.89	--	--
Cyanide & Cyanogen	0.66	0.04	0.09	0.74	0.25	0.37	0.93	0.25	0.24
DMNA	0.02	--	--	0.00	--	--	0.08	--	--
Hydrogen Sulfide	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nickel Carbonyl	--	--	--	--	--	--	--	--	--
Nitrous Oxide	27.	21.	10.	9.	5.	3.	--	--	--

TABLE C-18. CAR 152 - 12 PERCENT IGNITION MISFIRE (CONT'D)
1978 FORD MUSTANG II - 49 STATE W/O AIR PUMP

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	152.11	152-12	152.13	152-21	152-22	152-23	152-31	152-32	152-33
Aldehydes and Ketones									
Formaldehyde	2.49	0.57	0.28	2.41	1.32	4.46	2.89	1.33	4.63
Acetaldehyde	0.37	0.00	0.00	1.77	0.04	0.64	1.13	0.82	1.65
Acetone	0.00	0.00	0.00	0.43	0.00	0.00	0.00	0.00	0.00
Isobutyraldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone	0.04	0.00	0.08	0.18	0.11	0.16	0.00	0.00	0.00
Crotonaldehyde	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.25	0.02	0.53	0.00	0.35	0.00	0.10	0.05	0.09
Benzaldehyde	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	3.2	0.6	0.9	4.8	1.8	5.3	4.1	2.2	6.4
Total as % of THC, %	1.1	0.0	1.3	0.3	0.3	1.8	0.3	0.5	2.3
Individual Hydrocarbons									
Methane	36.61	23.	16.	60.	26.	21.	18.	--	--
Ethylene	19.49	3.	1.	9.	4.	9.	9.	--	--
Ethane	11.96	6.	3.	8.	3.	3.	3.	--	--
Acetylene	0.64	0.	0.	0.	0.	0.	0.	--	--
Propane	1.42	2.	0.	15.	15.	3.	17.	--	--
Propylene	11.28	0.	0.	4.	3.	8.	4.	--	--
Benzene	13.64	4.	2.	30.	15.	9.	44.	--	--
Toluene	27.35	17.	6.	25.	17.	12.	51.	--	--
Total Individual HC	122.4	55.	28.	151.	83.	65.	146.	--	--
Total as % of THC, %	42.2	55.	31.	10.	16.	22.	9.		
Organic Sulfides									
Carbonyl Sulfide	0.05	0.20	0.19	0.23	0.30	0.18	0.17	--	0.07
Methyl Sulfide	0.19	0.26	0.00	0.01	0.00	0.00	0.01	--	0.00
Ethyl Sulfide	0.02	0.08	0.00	0.00	0.00	0.00	0.00	--	0.00
Methyl Disulfide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00
Organic Amines									
Monomethylamine	0.00	0.00	0.12	0.00	0.01	0.00	0.00	0.00	0.00
Monoethylamine	0.01	0.02	0.09	0.02	0.01	0.01	0.00	0.00	0.00
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE C-18. CAR 152 - 12 PERCENT IGNITION MISFIRE (Cont'd)
1978 FORD MUSTANG II - 49 STATE W/O AIR PUMP

		EMISSION RATE, MG/KM (Except at Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		152-11	152-12	152-13	152-21	152-22	152-23	152-31	152-32	152-33
Other Elements										
Chromium	Cr									
Lead	Pb *	--	--	--	--	--	--	--	--	--
Manganese	Mn									
Arsenic	As									
Mercury	Hg									
Bromine	Br									
Phosphorus	P							0.02		
Silicon	Si								0.01	
Cadmium	Cd									
Aluminum	Al									
Sulfur	S	0.01	0.12	0.06		0.03	0.02	0.13		0.02
Sodium	Na									
Fluorine	F									
Magnesium	Mg							0.01		
Potassium	K									
Chlorine	Cl					0.01		0.03		
Platinum	Pt									
Zinc	Zn		0.04					0.03		
Copper	Cu							0.05		
Nickel	Ni									
Iron	Fe					0.10		1.70	0.03	0.04
Vanadium	V									
Titanium	Ti									
Barium	Ba	0.01	0.01			0.02	0.01	0.05		0.01
Calcium	Ca								0.03	

*Blank filter had high Pb

TABLE C-19. CAR 153 - DISABLED EGR
1978 FORD MUSTANG II - 49 STATE W/O AIR PUMP

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	153-11	153-12	153-13	153-21	153-22	153-23	153-31	153-32	153-33
Barometer, mm Hg	740.7	740.9	740.9	743.2	743.2	743.2	742.4	741.4	741.4
Humidity, g/kg	10.7	8.9	8.9	11.6	9.3	8.1	12.1	9.1	9.2
Temperature, °C	21.7	22.8	22.8	22.8	23.3	24.4	23.3	22.2	25.0
Total Fuel Sulfur, mg/km	25.37	20.40	17.88	32.98	26.89	23.49	31.89	25.82	23.02
Avg. Exh. Oxygen, %	3.42	2.81	1.46	3.55	2.90	1.34	3.76	2.85	1.23
Catalyst Avg. Temp., °C	431.	517.	583.	418.	498.	569.	412.	494.	563.
Catalyst Max. Temp., °C	542.	618.	644.	525.	614.	631.	521.	610.	636.
Carbon Dioxide, g/km	342.7	280.0	245.7	355.7	293.3	256.4	343.5	281.5	251.1
Fuel Cons., ℓ/100 km	14.93	12.00	10.52	15.39	12.55	10.96	14.88	12.05	10.74
Regulated Emissions									
Hydrocarbons, (THC), g/km	0.37	0.09	0.06	0.31	0.07	0.05	0.34	0.08	0.05
Carbon Monoxide, g/km	3.74	0.61	0.42	2.53	0.29	0.16	2.60	0.32	0.24
Oxides of Nitrogen, g/km	1.10	0.93	0.85	4.12	4.74	4.52	4.18	4.51	4.20
Particulates									
Total Particulates	5.68	4.89	2.78	9.35	5.49	5.27	8.07	6.04	4.23
Sulfate	0.65	0.59	0.18	0.25	1.51	2.53	0.20	0.99	0.83
Sulfate as % of TFS, %	0.85	0.96	0.34	0.25	1.87	3.59	0.21	1.28	1.20
Compound Group Totals									
Aldehydes & Ketones	3.8	0.9	2.3	4.9	5.4	5.0	7.5	7.2	1.9
Individual Hydrocarbons	148.	37.	27.	157.	37.	27.	--	--	--
Organic Sulfides	0.02	0.00	0.03	0.05	0.05	0.01	0.01	0.02	0.00
Organic Amines	0.02	0.00	0.00	0.04	0.02	0.00	0.06	0.00	0.00
Other Compounds									
Ammonia	2.60	--	--	2.27	--	--	2.60	--	--
Cyanide & Cyanogen	0.29	0.04	0.02	0.49	0.00	0.00	0.62	0.00	0.00
DMNA	0.00	--	--	--	--	--	--	--	--
Hydrogen Sulfide	0.05	0.17	0.92	0.00	0.00	0.08	0.00	0.05	0.00
Nickel Carbonyl	--	--	--	--	--	--	--	--	--
Nitrous Oxide	--	--	--	45.	24.	27.	--	--	24.

TABLE C-19. CAR 153 - DISABLED EGR (CONT'D)
1978 FORD MUSTANG II - 49 STATE W/O AIR PUMP

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	153-11	153-12	153-13	153-21	153-22	153-23	153-31	153-32	153-33
Aldehydes and Ketones									
Formaldehyde	1.83	0.61	0.68	3.31	3.11	3.24	4.17	5.05	1.72
Acetaldehyde	1.13	0.00	1.27	0.18	0.00	0.00	0.00	0.00	0.00
Acetone	0.39	0.04	0.25	0.07	0.00	0.00	0.35	0.04	0.00
Isobutyraldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone	0.25	0.09	0.06	0.21	0.18	0.25	0.79	0.25	0.14
Crotonaldehyde	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.20	0.11	0.07	1.13	2.12	1.46	2.23	1.87	0.00
Benzaldehyde	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	3.8	0.9	2.3	4.9	5.4	5.0	7.5	7.2	1.9
Total as % of THC, %	1.0	1.0	3.8	1.6	7.7	10.0	2.2	9.0	3.8
Individual Hydrocarbons									
Methane	53.	25.	20.	74.	24.	20.	--	--	--
Ethylene	28.	2.	0.	17.	1.	1.	--	--	--
Ethane	5.	5.	3.	23.	7.	5.	--	--	--
Acetylene	0.	0.	0.	0.	0.	0.	--	--	--
Propane	3.	1.	2.	5.	1.	1.	--	--	--
Propylene	13.	0.	0.	7.	0.	0.	--	--	--
Benzene	15.	2.	1.	15.	2.	0.	--	--	--
Toluene	31.	2.	1.	16.	2.	0.	--	--	--
Total Individual HC	148.	37.	27.	157.	37.	27.	--	--	--
Total as % of THC, %	40.	62.	45.	51.	53.	54.	--	--	--
Organic Sulfides									
Carbonyl Sulfide	0.00	0.00	0.01	0.01	<0.01	0.00	<0.01	0.00	0.00
Methyl Sulfide	0.02	0.00	0.02	0.04	0.04	<0.01	0.00	<0.01	0.00
Ethyl Sulfide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<0.00	0.00
Methyl Disulfide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Organic Amines									
Monomethylamine	0.02	0.00	0.00	0.02	0.00	0.00	0.06	0.00	0.00
Monoethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trimethylamine	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE C-19. CAR 153 - DISABLED EGR (Cont'd)
1978 FORD MUSTANG II - 49 STATE W/O AIR PUMP

		EMISSION RATE, MG/KM (Except at Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		153-11	153-12	153-13	153-21	153-22	153-23	153-31	153-32	153-33
Other Elements										
Chromium	Cr									
Lead	Pb*	--	--	--	--	--	--	--	--	--
Manganese	Mn									
Arsenic	As									
Mercury	Hg									
Bromine	Br									
Phosphorus	P	0.01			0.01			0.01		
Silicon	Si									
Cadmium	Cd									
Aluminum	Al									
Sulfur	S	0.02	0.16	0.31	0.02	0.60	1.08	0.02	0.43	0.32
Sodium	Na									
Fluorine	F									
Magnesium	Mg	0.01								
Potassium	K									
Chlorine	Cl									
Platinum	Pt									
Zinc	Zn									
Copper	Cu		0.04							
Nickel	Ni									
Iron	Fe	0.09		0.04	0.07		0.14	0.10	0.07	
Vanadium	V									
Titanium	Ti									
Barium	Ba	0.02	0.02	0.01	0.02	0.01		0.01	0.02	
Calcium	Ca									

*Blank filter had high Pb

TABLE C-20. CAR 154 - HIGH OIL CONSUMPTION
1978 FORD MUSTANG II - 49 STATE

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	154-11	154-12	154-13	154-21	154-22	154-23	154-31	154-32	154-33
Barometer, mm Hg	740.9	740.9	740.7	740.7	741.2	741.2	742.4	742.4	742.4
Humidity, g/kg	10.9	8.6	8.6	10.9	10.0	9.9	10.6	10.6	10.4
Temperature, °C	21.1	23.3	23.3	22.8	23.3	25.0	23.3	23.3	27.2
Total Fuel Sulfur, mg/km	31.69	25.99	23.80	33.13	26.43	23.37	32.94	26.52	23.40
Avg. Exh. Oxygen, %	5.40	4.03	2.17	3.50	2.45	0.95	3.66	2.84	1.25
Catalyst Avg. Temp., °C	--	563.	620.	472.	558.	619.0	474.	561.	618.
Catalyst Max. Temp., °C	597.	652.	661.	612.	674.	695.	588.	652.	666.
Carbon Dioxide, g/km	339.7	282.8	259.6	350.3	284.3	253.4	351.1	285.7	254.1
Fuel Cons., ℓ/100 km	14.79	12.13	11.11	15.46	12.33	10.91	15.37	12.38	10.92
Regulated Emissions									
Hydrocarbons, (THC), g/km	0.31	0.10	0.06	0.54	0.19	0.09	0.42	0.18	0.09
Carbon Monoxide, g/km	3.73	0.63	0.30	6.47	2.53	1.17	4.94	2.37	0.87
Oxides of Nitrogen, g/km	0.94	0.93	0.94	0.84	0.84	0.62	0.90	1.00	0.87
Particulates									
Total Particulates	8.28	3.10	2.81	12.81	5.28	1.98	8.99	8.10	4.65
Sulfate	0.61	0.62	1.44	13.15	0.23	0.18	5.62	0.29	0.28
Sulfate as % of TFS, %	0.64	0.80	2.02	13.23	0.29	0.26	5.69	0.36	0.40
Compound Group Totals									
Aldehydes & Ketones	1.1	0.7	0.6	2.0	0.7	0.5	1.7	0.9	1.6
Individual Hydrocarbons	--	--	--	--	--	--	--	--	--
Organic Sulfides	0.53	0.16	0.00	0.68	0.31	0.09	0.47	0.20	0.09
Organic Amines	0.00	0.03	0.02	0.00	0.00	0.01	0.01	0.00	0.01
Other Compounds									
Ammonia	--	--	--	--	--	--	--	--	--
Cyanide & Cyanogen	--	--	--	--	--	--	--	--	--
DMNA	--	--	--	--	--	--	--	--	--
Hydrogen Sulfide	0.04	0.15	0.15	0.00	0.21	0.11	0.00	0.11	0.12
Nickel Carbonyl	--	--	--	--	--	--	--	--	--
Nitrous Oxide	--	--	--	--	--	--	--	--	--

TABLE C-20. CAR 154 - HIGH OIL CONSUMPTION (CONT'D)
1978 FORD MUSTANG II - 49 STATE

	EMISSION RATE, MG/KM (Except as Noted)								
	UNMODIFIED			WITH MALFUNCTION CONDITION					
	FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	154-11	154-12	154-13	154-21	154-22	154-23	154-31	154-32	154-33
Aldehydes and Ketones									
Formaldehyde	0.41	0.00	0.00	0.45	0.00	0.02	0.73	0.55	0.05
Acetaldehyde	0.39	0.39	0.36	1.38	0.42	0.17	0.41	0.00	0.67
Acetone	0.05	0.27	0.14	0.06	0.26	0.31	0.12	0.19	0.12
Isobutyraldehyde	0.10	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone	0.09	0.00	0.00	0.05	0.00	0.00	0.18	0.09	0.00
Crotonaldehyde	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.10	0.06	0.08	0.00	0.06	0.00	0.22	0.11	0.65
Benzaldehyde	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	1.1	0.7	0.6	2.0	0.7	0.5	1.7	0.9	1.6
Total as % of THC, %	0.4	0.7	1.0	0.4	0.4	0.6	0.4	0.5	1.8
Individual Hydrocarbons									
Methane	--	--	--	--	--	--	--	--	--
Ethylene	--	--	--	--	--	--	--	--	--
Ethane	--	--	--	--	--	--	--	--	--
Acetylene	--	--	--	--	--	--	--	--	--
Propane	--	--	--	--	--	--	--	--	--
Propylene	--	--	--	--	--	--	--	--	--
Benzene	--	--	--	--	--	--	--	--	--
Toluene									
Total Individual HC	--	--	--	--	--	--	--	--	--
Total as % of THC, %	--	--	--	--	--	--	--	--	--
Organic Sulfides									
Carbonyl Sulfide	0.42	0.11	0.00	0.62	0.22	0.07	0.37	0.15	0.07
Methyl Sulfide	0.11	0.05	0.00	0.02	0.02	0.02	0.07	0.02	0.02
Ethyl Sulfide	0.00	0.00	0.00	0.04	0.07	0.00	0.03	0.03	0.00
Methyl Disulfide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Organic Amines									
Monomethylamine	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Monoethylamine	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Trimethylamine	0.00	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.01
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE C-20. CAR 154 - HIGH OIL CONSUMPTION (Cont'd)
1978 FORD MUSTANG II - 49 STATE

		EMISSION RATE, MG/KM (Except at Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		154-11	154-12	154-13	154-21	154-22	154-23	154-31	154-32	154-33
Other Elements										
Chromium	Cr									
Lead	Pb*	--	--	--	--	--	--	--	--	--
Manganese	Mn									
Arsenic	As									
Mercury	Hg									
Bromine	Br									
Phosphorus	P				0.37	0.26	0.18	0.33	0.28	0.20
Silicon	Si				0.01	0.01		0.02		
Cadmium	Cd									
Aluminum	Al		0.01					0.01		
Sulfur	S	0.05	0.22	0.60	0.06	0.06	0.03	0.10	0.08	0.05
Sodium	Na									
Fluorine	F									
Magnesium	Mg				0.24	0.17	0.13	0.19	0.17	0.14
Potassium	K				0.02	0.01		0.04	0.01	
Chlorine	Cl	0.05	0.04		0.16	0.15	0.11	0.30	0.12	0.05
Platinum	Pt									
Zinc	Zn				0.32	0.20	0.11	0.24	0.23	0.15
Copper	Cu									
Nickel	Ni									
Iron	Fe	0.26	0.05	0.01	0.11	0.05		0.33	0.07	0.05
Vanadium	V									
Titanium	Ti									
Barium	Ba	0.01	0.01	0.01	0.64	0.47	0.35	0.55	0.54	0.39
Calcium	Ca				0.04	0.01		0.09	0.01	0.01

*Blank filter had high Pb

APPENDIX D

FTP INDIVIDUAL SAMPLE EMISSIONS RESULTS

	Car	Description
TABLES D-1 through D-4	11	1977 AMC Pacer
TABLES D-5 through D-8	12	1978 Chevrolet Malibu
TABLES D-9 through D-12	13	1978 Chev. Malibu (Calif.)
TABLES D-13 through D-16	14	1978 Ford Granada
TABLES D-17 through D-20	15	1978 Ford Mustang II

TABLE D-1 . FTP INDIVIDUAL SAMPLE EMISSIONS RESULTS
Test Series No. 111 - Rich Best Idle

	Emissions in mg/km					
	Unmodified		Malfunction			
	111-11		111-21		111-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	45.29	29.04	35.92	20.47	32.28	20.26
Sulfates	0.50	0.25	0.50	0.21	0.30	0.13
Ammonia	5.25	2.28	2.64	2.65	1.51	1.18
Cyanides & Cyanogen	2.69	1.07	1.39	0.56	2.48	2.55
Hydrogen Sulfide	0.18	0	0.48	0	0.52	0
Aldehydes & Ketones						
Formaldehyde	15.05	6.89	25.53	8.64	8.29	10.13
Acetaldehyde	4.87	2.60	5.22	1.37	2.06	0.96
Acetone	3.43	1.17	0.36	0	0	0
Isobutyraldehyde	0	0	0	0	0	0
Methyl ethyl ketone	1.13	0.29	0.24	0.35	0	0
Crotonaldehyde	--	--	--	--	--	--
Hexanaldehyde	0.20	0.06	0.02	0.02	0.21	0.08
Benzaldehyde	--	--	--	--	--	--
Organic Sulfides						
Carbonyl sulfide	0.25	0.11	0.67	0	0.11	0.04
Methyl sulfide	0.14	0	0.07	< 0.01	0.07	0.04
Ethyl sulfide	0.11	0.07	0.07	0.06	0.07	0.04
Methyl disulfide	0.11	0.04	0.14	0	0.07	0
Organic Amines						
Monomethylamine	0.04	0.03	0	0	0.02	0
Monoethylamine & dimethylamine	0	0.05	0	0	0.11	0.10
Trimethylamine	0	0	0	0	0.05	0.06
Diethylamine	0	0	0	0	0	0
Triethylamine	0	0	0	0	0	0

	Emissions in ppm											
	COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS	
	1	2	3	4	1	2	3	4	1	2	3	4
Individual Hydrocarbons												
Methane	8.87	1.77	2.68	0.72	26.03	3.67	5.92	2.83	22.06	4.22	12.14	2.20
Ethylene	15.74	5.84	10.29	4.60	21.44	6.07	11.86	5.55	20.07	6.32	13.82	5.19
Ethane	1.29	0.47	0.60	0.31	1.53	0.29	0.61	0.24	1.58	0.43	0.97	0.34
Acetylene	7.50	2.15	3.77	1.60	19.89	2.08	4.36	1.84	17.31	2.22	10.48	1.83
Propane	0.16	0.03	0.03	0.01	0.23	0.15	0.18	0.09	0.19	0	0.33	0.03
Propylene	7.35	2.67	4.54	2.13	8.44	2.39	4.80	2.32	7.95	2.29	5.59	2.04
Benzene	8.22	2.78	4.93	1.92	9.87	2.95	5.76	2.65	10.69	5.91	11.95	2.34
Toluene	7.69	3.80	7.63	2.38	9.08	3.27	9.53	3.38	14.24	2.91	14.85	2.19
Other												
Nitrous Oxide	0.07	0.03	0.11	0.06	0.05	0.04	0.04	0.03	0.10	0.06	0.12	0.07
Nickel Carbonyl	0	0	0	0	0	0	0	0	0	0	0	0

TABLE D-2. FTP INDIVIDUAL SAMPLE UNREGULATED EMISSIONS RESULTS
Test Series No. 112 - Twelve Percent Ignition Misfire

	Emissions in mg/km					
	Unmodified		Malfunction			
	112-11		112-21		112-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	29.21	27.75	56.37	41.78	54.98	43.44
Sulfates	0.17	0.14	1.43	0.92	1.25	0.94
Ammonia	0.88	1.12				
Cyanides & Cyanogen	1.43	2.39	0.90	0.76	0.66	0.58
Hydrogen Sulfide	0	0	0.66	0.39	0.65	0.21
Aldehydes & Ketones						
Formaldehyde	8.47	4.06	74.59	28.11	107.38	98.61
Acetaldehyde	1.63	0.82	30.47	15.47	41.05	39.48
Acetone	0.25	0	9.62	5.07	14.23	12.00
Isobutyraldehyde	0	0	0	0	0	0
Methyl ethyl ketone	0.20	0.11	5.80	3.34	7.04	5.57
Crotonaldehyde	--	--	--	--	--	--
Hexanaldehyde	0	0.13	2.13	0.79	2.67	2.31
Benzaldehyde	--	--	--	--	--	--
Organic Sulfides						
Carbonyl sulfide	0.21	0	0.65	0.10	0.77	0.22
Methyl sulfide	0.18	0	0	0	0	0
Ethyl sulfide	0	0	0.01	0	0	0
Methyl disulfide	0	0	0.04	0	0	0
Organic Amines						
Monomethylamine	0	0	0	0	0.11	0.19
Monoethylamine & dimethylamine	0	0	0	0	0	0.07
Trimethylamine	0	0	0	0	0	0
Diethylamine	0	0	0	0	0	0
Triethylamine	0	0	0	0	0	0

TABLE D-3. FTP INDIVIDUAL SAMPLE UNREGULATED EMISSIONS RESULTS
Test Series No. 113 - Disabled EGR

	Emissions in mg/km					
	Unmodified		Malfunction			
	113-11		113-21		113-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	28.62	21.55	22.18	13.64	12.18	17.67
Sulfates	0.31	2.11	0.71	0.88	0.51	0.24
Ammonia	3.23	5.57	4.61	4.60	1.89	2.12
Cyanides & Cyanogen	3.40	3.24	5.40	3.39	4.08	3.88
Hydrogen Sulfide	0.13	0	0.23	0	0.28	0
Aldehydes & Ketones						
Formaldehyde	10.11	7.72	14.80	8.77	13.26	8.86
Acetaldehyde	0.62	0.73	3.14	3.22	2.51	0.25
Acetone	0	0	0.80	1.40	1.00	0.79
Isobutyraldehyde	0	0	0	0	0	0
Methyl ethyl ketone	0.17	0.30	0.42	1.03	2.72	0.08
Crotonaldehyde	--	--	--	--	--	--
Hexanaldehyde	0.22	0.37	0.20	0.32	0.14	0
Benzaldehyde	--	--	--	--	--	--
Organic Sulfides						
Carbonyl sulfide	--	0.11	--	0.17	0.17	0
Methyl sulfide	--	0.01	--	0.20	0.08	0.03
Ethyl sulfide	--	0	--	0.09	0.02	0
Methyl disulfide	--	0	--	0	0	0
Organic Amines						
Monomethylamine	0	0	0.01	0.04	0	0
Monoethylamine & dimethylamine	0	0	0.02	0.01	0	0
Trimethylamine	0	0	0	0	0	0
Diethylamine	0	0	0	0	0	0
Triethylamine	0	0	0	0	0	0

TABLE D-4. FTP INDIVIDUAL SAMPLE UNREGULATED EMISSIONS RESULTS

Test Series No. 114 - High Oil Consumption

	Emissions in mg/km					
	Unmodified		Malfunction			
	114-11		114-21		114-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	39.45	33.98	55.69	39.03	43.77	35.48
Sulfates	1.20	0.66	1.76	0.81	1.94	0.95
Ammonia	--	--	--	--	--	--
Cyanides & Cyanogen	--	--	--	--	--	--
Hydrogen Sulfide	0.08	0	0.88	0.09	0.43	0
Aldehydes & Ketones						
Formaldehyde	19.13	9.66	27.05	21.45	22.17	17.64
Acetaldehyde	5.31	2.92	6.46	8.03	10.05	4.90
Acetone	1.12	0.58	0.43	2.05	1.69	0.82
Isobutyraldehyde	0	0	0	0	0	0
Methyl ethyl ketone	0.45	0.31	0.43	0.75	0.70	0.65
Crotonaldehyde	--	--	--	--	--	--
Hexanaldehyde	0.29	0.26	0.21	0.20	0.49	0.80
Benzaldehyde	--	--	--	--	--	--
Organic Sulfides						
Carbonyl sulfide	0.11	0	0	0.01	0.25	0.15
Methyl sulfide	0.07	0.06	0	0.01	0.11	0.14
Ethyl sulfide	0	0	0	0	0.01	0
Methyl disulfide	0	0	0	0	0	0
Organic Amines						
Monomethylamine	0	0	0	0	0	0
Monoethylamine & dimethylamine	0.05	0.03	0	0	0	0
Trimethylamine	0	0	0	0	0	0
Diethylamine	0	0	0	0	0	0
Triethylamine	0	0	0	0	0	0

TABLE D-5. FTP INDIVIDUAL SAMPLE EMISSIONS RESULTS
Test Series No. 121 - Rich Best Idle

	Emissions in mg/km					
	Unmodified		Malfunction			
	121-11		121-21		121-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	16.38	4.47	18.59	8.61	12.47	1.02
Sulfates	0.23	0.16	0.58	0.37	0.52	0.23
Ammonia	2.98	2.20	11.95	18.63	17.92	21.73
Cyanides & Cyanogen	0.66	0.15	3.15	2.90	3.29	2.02
Hydrogen Sulfide	0	0	0.13	0.13	0.19	0.04
Aldehydes & Ketones						
Formaldehyde	1.24	0	2.24	0.73	2.56	0.23
Acetaldehyde	0.37	0	1.88	0	0	0
Acetone	0.05	0	0	0	0	0
Isobutyraldehyde	0	0	0	0	0	0.10
Methyl ethyl ketone	0	0	0.40	0.40	0	0
Crotonaldehyde	--	--	--	--	--	--
Hexanaldehyde	0	0	0.10	0	0.10	0
Benzaldehyde	--	--	--	--	--	--
Organic Sulfides						
Carbonyl sulfide	0.11	0	0.11	3.37	0.25	0.04
Methyl sulfide	0	0	0	0.01	0.00	0.11
Ethyl sulfide	0	0.11	0.07	0.18	0.18	0.11
Methyl disulfide	0	0	0	0	0.07	0.04
Organic Amines						
Monomethylamine	0	0	0	0	0	0
Monoethylamine & dimethylamine	0	0	0.10	0.11	0.03	0.12
Trimethylamine	0	0	0.09	0	0	0.02
Diethylamine	0	0	0	0	0	0
Triethylamine	0	0	0	0	0	0

	Emissions in ppm											
	COLD-UDDS		HOT UDDS		COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS	
	1	2	3	4	1	2	3	4	1	2	3	4
Individual Hydrocarbons												
Methane	11.17	1.81	3.28	1.47	22.12	9.50	8.36	7.88	19.71	9.66	8.66	7.46
Ethylene	14.28	0.10	1.28	0.05	30.22	11.42	11.35	9.69	23.91	11.32	11.40	8.66
Ethane	1.96	0.67	1.15	0.59	3.55	2.03	2.29	1.74	2.97	2.17	2.72	1.73
Acetylene	4.83	0	0	0	8.55	0	0	0	8.29	0	0	0
Propane	0.22	0	0.08	0	0.30	0	0.29	0.24	0.30	0.19	0.24	0.19
Propylene	6.65	0	0.68	0	12.09	4.61	4.98	4.13	9.36	4.42	4.63	3.72
Benzene	7.95	0.74	1.32	0	15.58	9.53	8.91	8.49	8.25	9.66	8.12	7.80
Toluene	15.38	1.95	0.96	0	13.69	13.03	10.43	11.33	0	12.40	9.96	9.56
Other												
Nitrous Oxide	1.77	0.54	3.42	0.26	0.78	1.38	3.91	1.27	1.36	1.36	3.62	1.25
Nickel Carbonyl	0	0	0	0	0	0	0	0	0	0	0	0

TABLE D-6 . FTP INDIVIDUAL SAMPLE UNREGULATED EMISSIONS RESULTS

Test Series No. 122 - Twelve Percent Ignition Misfire

	Emissions in mg/km					
	Unmodified		Malfunction			
	122-11		122-21		122-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	--	1.70	7.13	2.71	6.38	1.83
Sulfates	0.96	0.23	0.14	0.14	0.41	0.41
Ammonia	1.50	2.34				
Cyanides & Cyanogen	0.99	0.28	2.83	2.80	2.21	2.69
Hydrogen Sulfide	0	0	0	0	0	0
Aldehydes & Ketones						
Formaldehyde	2.42	0	4.92	0.38	4.60	0.48
Acetaldehyde	0	0	3.43	0	5.66	0.57
Acetone	0	0	0	0	1.14	0.18
Isobutyraldehyde	0	0	0	0	0	0
Methyl ethyl ketone	0	0	0	0	0.36	0.05
Crotonaldehyde	--	--	--	--	--	--
Hexanaldehyde	0.13	0.14	0.19	0.20	0	0
Benzaldehyde	--	--	--	--	--	--
Organic Sulfides						
Carbonyl sulfide	0	0.92	0.09	0	0.07	0.04
Methyl sulfide	0.15	0.09	<0.01	0.06	0	0.02
Ethyl sulfide	0.12	0	<0.01	0	0.01	0
Methyl disulfide	0	0	0	0	0	0
Organic Amines						
Monomethylamine	0	0	0.01	0	0	0
Monoethylamine & dimethylamine	0	0	0.03	0	0	0
Trimethylamine	0	0	0	0	0	0
Diethylamine	0	0	0	0	0	0
Triethylamine	0	0	0	0	0	0

TABLE D-7. FTP INDIVIDUAL SAMPLE UNREGULATED EMISSIONS RESULTS
Test Series No. 123 - Disabled EGR

	Emissions in mg/km					
	Unmodified		Malfunction			
	123-11		123-21		123-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	6.73	2.56	9.45	8.22	7.10	2.26
Sulfates	2.43	0.22	0.49	0.21	0.32	0.12
Ammonia	4.31	4.90	1.83	2.30	2.24	3.55
Cyanides & Cyanogen	1.79	0.13	2.43	0.70	3.42	1.49
Hydrogen Sulfide	3.95	2.54	0	0	0	0
Aldehydes & Ketones						
Formaldehyde	3.20	0.39	3.82	2.04	2.54	0.95
Acetaldehyde	0.63	0	1.91	0.75	1.18	0
Acetone	0	0	0.48	0.33	0.32	0
Isobutyraldehyde	0	0	0	0	0	0
Methyl ethyl ketone	0	0	0.27	0.18	0.27	0.06
Crotonaldehyde	--	--	--	--	--	--
Hexanaldehyde	0.19	0.18	0.07	0.08	0.20	0.07
Benzaldehyde	--	--	--	--	--	--
Organic Sulfides						
Carbonyl sulfide	0.17	0.25	0.25	0.07	0.07	0
Methyl sulfide	1.40	0	0.05	0	0	0
Ethyl sulfide	0.08	0	0.01	0.02	0.01	0
Methyl disulfide	0	0	0	0	0	0
Organic Amines						
Monomethylamine	0	0	0	0	0	0
Monoethylamine & dimethylamine	0	0	0	0	0	0
Trimethylamine	0	0	0	0	0	0
Diethylamine	0	0	0	0	0	0
Triethylamine	0	0	0	0	0	0

TABLE D-8. FTP INDIVIDUAL SAMPLE UNREGULATED EMISSIONS RESULTS
Test Series No. 124 - High Oil Consumption

	Emissions in mg/km					
	Unmodified		Malfunction			
	124-11		124-21		124-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	5.95	1.84	10.59	4.59	15.97	8.54
Sulfates	2.62	1.38	2.08	1.29	7.31	1.58
Ammonia	--	--	--	--	--	--
Cyanides & Cyanogen	--	--	--	--	--	--
Hydrogen Sulfide	0	0	0	0	0	0
Aldehydes & Ketones						
Formaldehyde	1.98	0.68	0.66	0.18	0	0
Acetaldehyde	1.83	0	0.94	0	0	0
Acetone	0.41	0	0.09	0	0.32	0
Isobutyraldehyde	0	0	0	0	0	0.11
Methyl ethyl ketone	0.19	0.29	0.27	0.16	0	0.16
Crotonaldehyde	--	--	--	--	--	--
Hexanaldehyde	0.11	0.11	0.20	0.07	0	0.10
Benzaldehyde	--	--	--	--	--	--
Organic Sulfides						
Carbonyl sulfide	0.09	0.07	0.01	0.16	0.37	0.17
Methyl sulfide	0.14	0.15	<0.01	0.12	0.08	0.06
Ethyl sulfide	0	0	0	0.02	0.10	0.01
Methyl disulfide	0	0	0	0	<0.01	0
Organic Amines						
Monomethylamine	0	0	0	0	0	0
Monoethylamine & dimethylamine	0	0.02	0.01	0	0	0.01
Trimethylamine	0.01	0	0	0	0	0
Diethylamine	0	0	0	0	0	0
Triethylamine	0	0	0	0	0	0

TABLE D-9. FTP INDIVIDUAL SAMPLE EMISSIONS RESULTS
Test Series No. 131 - Rich Best Idle

Emissions in mg/km

	Unmodified 131-11		Malfunction 131-21		Malfunction 131-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	3.63	1.28	--	79.32	--	16.97
Sulfates	1.17	0.93	2.28	1.89	1.73	2.24
Ammonia	3.42	1.82	5.45	3.33	2.08	1.91
Cyanides & Cyanogen	0.08	0.05	0.39	0.29	0.27	0.17
Hydrogen Sulfide	0	0	0	0	0	0
Aldehydes & Ketones						
Formaldehyde	1.64	0.67	2.47	0.58	1.71	0.20
Acetaldehyde	0	0.17	2.98	1.39	0.48	0.68
Acetone	0	0	0.74	0.37	0	0
Isobutyraldehyde	0	0	0	0	0	0
Methyl ethyl ketone	0	0.32	0.80	0.79	0.42	0.52
Crotonaldehyde	--	--	--	--	--	--
Hexanaldehyde	0	0	1.03	1.15	0.26	0.92
Benzaldehyde	--	--	--	--	--	--
Organic Sulfides						
Carbonyl sulfide	0.07	0	0	0	--	--
Methyl sulfide	0	0.04	0.01	0.04	--	--
Ethyl sulfide	0.11	0.25	0.14	0.18	--	--
Methyl disulfide	0	0	0	0	--	--
Organic Amines						
Monomethylamine	0	0	0	0.02	0	0
Monoethylamine & dimethylamine	0	0	0.06	0.04	0.08	0.02
Trimethylamine	0	0	0	0	0	0
Diethylamine	0	0	0	0	0	0
Triethylamine	0	0	0	0	0	0

Emissions in ppm

	COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS	
	1	2	3	4	1	2	3	4	1	2	3	4
Individual Hydrocarbons												
Methane	6.60	2.51	4.48	2.66	--	2.22	5.52	0.49	11.86	2.55	6.29	3.46
Ethylene	5.62	0.42	0.66	0.29	--	0.24	0.46	0.03	10.58	0.12	0.54	0.12
Ethane	1.37	0.67	0.98	0.57	--	0.19	0.57	0.05	1.70	0.17	0.51	0.15
Acetylene	0.71	0	0	0	--	0	0	0	1.85	0	0	0
Propane	0.14	0.05	0.07	0.04	--	--	--	--	5.96	--	--	--
Propylene	2.27	0.03	0.03	0	--	--	--	--	4.46	--	--	--
Benzene	2.77	0.04	0	0	--	1.50	0.19	0	5.75	0.12	0.45	0.14
Toluene	4.07	0.29	0	0	--	3.76	1.22	0.39	10.74	0.39	0.55	0.50
Other												
Nitrous Oxide	0.40	0.06	0.14	0.05	0.26	0	0.01	0	0.25	0	0.05	0
Nickel Carbonyl	0	0	0	0	0	0	0	0	0	0	0	0

TABLE D-10. FTP INDIVIDUAL SAMPLE UNREGULATED EMISSIONS RESULTS

Test Series No. 132 - Twelve Percent Ignition Misfire

	Emissions in mg/km					
	Unmodified		Malfunction			
	132-11		132-21		132-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	5.42	0.80	4.73	1.39	12.27	5.23
Sulfates	0.50	1.17	0.58	0.90	3.22	2.44
Ammonia	3.84	3.62	3.43	2.06	2.69	1.97
Cyanides & Cyanogen	0.10	0.10	0.21	0	0.16	0.16
Hydrogen Sulfide	0	0	0	0	0	0
Aldehydes & Ketones						
Formaldehyde	2.82	0.80	7.22	1.48	7.58	3.04
Acetaldehyde	0.82	0	2.90	0.91	2.09	1.40
Acetone	0	0	0.33	0.14	0.68	0.69
Isobutyraldehyde	0	0	0	0	0	0
Methyl ethyl ketone	0	0	0.19	0	0	0
Crotonaldehyde	--	--	--	--	--	--
Hexanaldehyde	0.22	0.23	0.13	0.13	0	0.13
Benzaldehyde	--	--	--	--	--	--
Organic Sulfides						
Carbonyl sulfide	0.04	0.04	0	0.35	0.56	0
Methyl sulfide	0.01	0.02	0	0.01	0.04	0.47
Ethyl sulfide	0.02	0.07	0	0	<0.01	0.01
Methyl disulfide	0	0	0	0	0	0
Organic Amines						
Monomethylamine	0.03	0	0.01	0.02	0	0
Monoethylamine & dimethylamine	0.05	0	0	0	0	0
Trimethylamine	0	0	0.01	0	0	0
Diethylamine	0	0	0	0	0	0
Triethylamine	0	0	0	0	0	0

TABLE D-11. FTP INDIVIDUAL SAMPLE UNREGULATED EMISSIONS RESULTS

Test Series No. 133 - Disabled EGR

	Emissions in mg/km					
	Unmodified		Malfunction			
	133-11		133-21		133-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	2.80	3.77	4.14	1.71	0.73	5.51
Sulfates	0.22	0.55	0.14	1.05	0.12	0.33
Ammonia	2.37	14.59				
Cyanides & Cyanogen	0.38	0.09	0.33	0.16	0.20	0.13
Hydrogen Sulfide	0	0	0	0	0	0
Aldehydes & Ketones						
Formaldehyde	3.17	0.66	5.53	4.69	7.69	2.61
Acetaldehyde	0.45	0	0	0	0	0
Acetone	0	0	0	0	0	0.22
Isobutyraldehyde	0	0	0	0	0	0
Methyl ethyl ketone	0	0	0	0	0.11	0.10
Crotonaldehyde	--	--	--	--	--	--
Hexanaldehyde	0	0	0	0	0.78	0
Benzaldehyde	--	--	--	--	--	--
Organic Sulfides						
Carbonyl sulfide	0	0	0.15	0.05	--	0.05
Methyl sulfide	0.04	0.12	0.21	0.14	--	0.15
Ethyl sulfide	0.02	0.01	0.01	0	--	0.04
Methyl disulfide	0	0	0	0	--	0.03
Organic Amines						
Monomethylamine	0	0	0.06	0.03	0	0
Moncethylamine & dimethylamine	0	0	0.11	0.04	0	0
Trimethylamine	0	0	0	0	0	0
Diethylamine	0	0	0	0	0	0
Triethylamine	0	0	0	0	0	0

TABLE D-12. FTP INDIVIDUAL SAMPLE UNREGULATED EMISSIONS RESULTS

Test Series No. 135 - No Air Inj. + R.B.I.

	Emissions in mg/km					
	Unmodified		Malfunction			
	135-11		135-21		135-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	4.48	5.82	19.08	7.64	23.94	13.63
Sulfates	0.45	0.71	0.36	0.29	1.73	0.70
Ammonia	4.68	6.74	8.60	9.67	19.58	12.91
Cyanides & Cyanogen	0.05	0	1.93	1.43	2.09	1.04
Hydrogen Sulfide	0	0	0.18	0.09	0.08	0.11
Aldehydes & Ketones						
Formaldehyde	0.73	0	3.15	0.98	1.78	0.72
Acetaldehyde	0	0	3.79	5.28	3.65	1.23
Acetone	0	0	2.53	3.79	1.66	0.54
Isobutyraldehyde	0	0	0	0	0	0
Methyl ethyl ketone	0	0	3.93	5.97	3.90	2.32
Crotonaldehyde	--	--	--	--	--	--
Hexanaldehyde	0	0	0.92	0.41	0.13	0
Benzaldehyde	--	--	--	--	--	--
Organic Sulfides						
Carbonyl sulfide	0.38	0.42	0.18	0.22	0.34	0.16
Methyl sulfide	0	0.14	0.01	0	0	0.02
Ethyl sulfide	0	0	0	0	0	0
Methyl disulfide	0	0	0	0	0	0
Organic Amines						
Monomethylamine	0	0	0.09	0.04	0	0
Monoethylamine & dimethylamine	0	0	0.05	0.04	0	0
Trimethylamine	0	0	0	0	0	0
Diethylamine	0	0	0	0	0	0
Triethylamine	0	0	0	0	0	0

TABLE D-13. FTP INDIVIDUAL SAMPLE EMISSIONS RESULTS
Test Series No. 141 - Rich Best Idle

	Emissions in mg/km					
	Unmodified		Malfunction			
	141-11		141-21		141-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	11.60	6.35	4.20	2.04	3.15	2.84
Sulfates	1.06	0.60	0.23	0.21	0.37	0.30
Ammonia						
Cyanides & Cyanogen	0.02	0	1.84	0.05	2.28	0.26
Hydrogen Sulfide	0	0	0.42	0.12	0.39	0.17
Aldehydes & Ketones						
Formaldehyde	1.15	0.73	2.63	0.32	2.51	0.46
Acetaldehyde	0	0.90	1.77	0	1.14	0
Acetone	0	0	0	0	0.27	0.36
Isobutyraldehyde	0	0	0	0	0	0
Methyl ethyl ketone	0.06	0.38	0	0	0.14	0.14
Crotonaldehyde	--	--	--	--	--	--
Hexanaldehyde	0.31	0.31	0.22	0.35	0.14	0.28
Benzaldehyde	--	--	--	--	--	--
Organic Sulfides						
Carbonyl sulfide	0	0	0	0	0	0
Methyl sulfide	0	0.04	0.01	<0.01	0.07	0
Ethyl sulfide	0.04	0.14	0	0.02	0	0
Methyl disulfide	0	0	0	0	0	0
Organic Amines						
Monomethylamine	0.02	0.003	0.03	0	0.02	0.16
Monoethylamine & dimethylamine	0	0	0.02	0	0.04	0.03
Trimethylamine	0	0	0	0	0	0
Diethylamine	0	0	0	0	0	0
Triethylamine	0	0	0	0	0	0

	Emissions in ppm											
	COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS	
	1	2	3	4	1	2	3	4	1	2	3	4
Individual Hydrocarbons												
Methane	7.20	0	3.94	2.23	14.55	11.21	9.75	10.67	12.94	10.93	10.87	10.13
Ethylene	6.81	0.24	0.75	0.75	12.07	1.68	3.18	1.10	14.76	1.42	3.38	1.13
Ethane	2.20	0.65	2.02	1.68	2.95	1.11	2.26	1.12	3.27	1.07	2.27	1.13
Acetylene	0.10	0	0	0	0.64	0	0	0	0.44	0	0	0
Propane	0.13	0	0.13	0.08	0.30	0.10	0.25	0.13	0.56	0.15	0.33	0.05
Propylene	4.10	0	0.34	0	4.76	0.44	0.90	0.20	6.06	0.24	0.87	0.20
Benzene	4.77	0	0	0	9.58	9.01	4.51	5.56	12.64	8.08	4.66	6.53
Toluene	10.70	0.37	0.90	0.72	2.60	2.07	2.89	0.51	14.74	1.44	3.34	0.99
Other												
Nitrous Oxide	1.14	0.43	0.87	0.27	0.70	0.10	0.44	0.13	0.66	0.11	0.43	0.12
Nickel Carbonyl	0	0	0	0	0	0	0	0	0	0	0	0

TABLE D-14. FTP INDIVIDUAL SAMPLE UNREGULATED EMISSIONS RESULTS
Test Series No. 142 - Twelve Percent Ignition Misfire

	Emissions in mg/km					
	Unmodified		Malfunction			
	142-11		142-21		142-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	7.28	3.37	14.65	8.15	19.38	10.75
Sulfates	0.42	0.63	--	0.28	0.34	0.30
Ammonia	1.27	1.26	2.13	6.66	3.03	2.42
Cyanides & Cyanogen	0.71	0	0.40	0	0.36	0
Hydrogen Sulfide	0	0	0	0	0	0
Aldehydes & Ketones						
Formaldehyde	4.51	3.90	7.45	2.88	5.98	2.33
Acetaldehyde	0	0	5.02	2.08	5.22	1.45
Acetone	0.20	0.12	2.68	0.83	1.42	0.17
Isobutyraldehyde	0	0	0	0	0.11	0
Methyl ethyl ketone	0.26	0.27	0.88	0.26	0.85	0.13
Crotonaldehyde	--	--	--	--	--	--
Hexanaldehyde	0.10	0.24	0.23	0.10	0.33	0.08
Benzaldehyde	--	--	--	--	--	--
Organic Sulfides						
Carbonyl sulfide	<0.01	0.17	--	<0.01	0.03	0
Methyl sulfide	0	0.04	0.01	0.11	<0.01	0
Ethyl sulfide	0	0	0	0	0	0
Methyl disulfide	0	0	0	0	0	0
Organic Amines						
Monomethylamine	0	0	0	0	0	0.01
Monoethylamine & dimethylamine	0	0	0	0	0	0
Trimethylamine	0	0	0	0	0.01	0
Diethylamine	0	0	0	0	0	0
Triethylamine	0	0	0	0	0	0

TABLE D-15. FTP INDIVIDUAL SAMPLE UNREGULATED EMISSIONS RESULTS
Test Series 143 - Disabled EGR and Air Pump

	Emissions in mg/km					
	Unmodified		Malfunction			
	143-11		143-21		143-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	11.76	4.01	13.77	8.39	14.65	5.88
Sulfates	0.29	0.37	0.56	0.15	0.29	0.09
Ammonia						
Cyanides & Cyanogen	0.76	0.06	2.85	0.73	2.75	0.14
Hydrogen Sulfide	0	0	0	0	0	0
Aldehydes & Ketones						
Formaldehyde	3.89	2.29	3.54	4.94	6.98	4.71
Acetaldehyde	0	0	0	0	0	0
Acetone	0	0	0	0	0	0
Isobutyraldehyde	0	0	0	0	0	0
Methyl ethyl ketone	0	0	0	0	0	0
Crotonaldehyde	--	--	--	--	--	--
Hexanaldehyde	0	0	1.72	2.13	2.34	2.07
Benzaldehyde	--	--	--	--	--	--
Organic Sulfides						
Carbonyl sulfide	0.06	0.01	0	0	0.05	0
Methyl sulfide	0.01	0.06	0	0.01	0	0.02
Ethyl sulfide	0	0	0	0	0	0
Methyl disulfide	0	0	0	0	0	0
Organic Amines						
Monomethylamine	0	0	0	0.04	0	0
Monoethylamine & dimethylamine	0	0	0.01	0.04	0	0
Trimethylamine	0.21	0	0	0	0	0
Diethylamine	0	0	0	0	0	0
Triethylamine	0	0	0	0	0	0

TABLE D-16. FTP INDIVIDUAL SAMPLE UNREGULATED EMISSIONS RESULTS
Test Series No. 145 - No Air Inj. + R.B.I.

	Emissions in mg/km					
	Unmodified		Malfunction			
	145-11		145-21		145-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	19.39	1.51	15.81	13.17	24.65	19.13
Sulfates	3.68	2.31	11.15	0.81	5.88	2.41
Ammonia	--	--	--	--	--	--
Cyanides & Cyanogen	--	--	--	--	--	--
Hydrogen Sulfide	0	0	0.32	0.86	0.52	0.92
Aldehydes & Ketones						
Formaldehyde	3.28	3.64	0.56	0.19	0.63	0.05
Acetaldehyde	0.09	0	0.77	0.49	0	0
Acetone	0.09	0	0	0	0	0.13
Isobutyraldehyde	0	0	0	0	0	0
Methyl ethyl ketone	0.18	0.18	0	0	0	0
Crotonaldehyde	--	--	--	--	--	--
Hexanaldehyde	0.11	0.11	0.07	0.21	0.53	0.13
Benzaldehyde	--	--	--	--	--	--
Organic Sulfides						
Carbonyl sulfide	--	0.11	0.03	0.82	0.91	0.81
Methyl sulfide	--	0	0.02	0.02	0.08	0.06
Ethyl sulfide	--	0	0	0.01	0.25	0.05
Methyl disulfide	--	0	0	0	0.18	<0.01
Organic Amines						
Monomethylamine	0	0	0	0	0	0
Monoethylamine & dimethylamine	0	0	0	0.03	0.01	0
Trimethylamine	0	0	0	0	0	0
Diethylamine	0	0	0	0	0	0
Triethylamine	0	0	0	0	0	0

TABLE D-17. FTP INDIVIDUAL SAMPLE EMISSIONS RESULTS
Test Series No. 151 - Rich Best Idle

Emissions in mg/km

	Unmodified		Malfunction			
	151-11		151-21		151-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	9.03	2.19	15.44	11.94	4.49	5.91
Sulfates	0.81	0.55	0.22	0.18	0.37	0.29
Ammonia	20.32	10.24	41.90	62.89	55.98	62.02
Cyanides & Cyanogen	0.33	0	7.46	6.61	4.18	6.17
Hydrogen Sulfide	0.13	0.26	0.41	0.66	0.26	0.84
Aldehydes & Ketones						
Formaldehyde	1.65	1.37	3.33	1.77	3.09	1.19
Acetaldehyde	0	0	1.64	0.92	3.69	1.64
Acetone	0	0.47	0.90	0	0	0
Isobutyraldehyde	0	0	0	0	0	0
Methyl ethyl ketone	0.22	0.53	0.03	0.03	0	0
Crotonaldehyde	--	--	--	--	--	--
Hexanaldehyde	0.20	0.20	0.23	0.24	0.10	0.24
Benzaldehyde	--	--	--	--	--	--
Organic Sulfides						
Carbonyl sulfide	0	0	0.09	0.17	0.49	--
Methyl sulfide	0	0	0.14	0.01	0.01	0.07
Ethyl sulfide	0	0	0.11	0.05	0.18	0.46
Methyl disulfide	0	0	0	0.13	0	0
Organic Amines						
Monomethylamine	0.02	0.01	0.02	0.06	0.02	0.02
Monoethylamine & dimethylamine	0.02	0.03	0.05	0.09	0.06	0.12
Trimethylamine	0	0	0	0	0	0
Diethylamine	0	0	0	0	0	0
Triethylamine	0	0	0	0	0	0

Emissions in ppm

	COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS	
	1	2	3	4	1	2	3	4	1	2	3	4
Individual Hydrocarbons												
Methane	9.06	2.79	4.75	2.77	25.75	24.71	22.25	20.39	28.57	16.94	21.44	21.72
Ethylene	10.54	0.34	2.25	0.15	33.81	35.34	29.62	29.19	36.31	3.29	4.75	4.51
Ethane	3.14	1.54	2.21	1.57	4.68	4.68	4.80	4.31	5.10	3.34	4.80	4.56
Acetylene	0.42	0	0	0	0.59	0	0	0	1.14	0	0	0
Propane	0.28	0.54	0.33	0.18	0.39	0	0.39	0.55	1.04	0.10	1.77	1.31
Propylene	5.26	0.21	2.56	0.90	11.39	8.51	8.61	7.38	10.55	5.56	7.14	6.88
Benzene	6.35	1.81	2.42	0.76	18.76	11.81	13.91	11.58	18.16	8.74	13.08	11.46
Toluene	4.45	1.81	3.17	0.28	32.08	8.98	22.13	17.77	28.81	12.57	19.07	17.29
Other												
Nitrous Oxide	1.21	0.39	1.09	0.38	0.91	1.32	1.49	1.64	0.59	1.17	2.10	1.47
Nickel Carbonyl	0	0	0	0	0	0	0	0	0	0	0	0

TABLE D-18. FTP INDIVIDUAL SAMPLE UNREGULATED EMISSIONS RESULTS
Test Series 152 - Twelve Percent Ignition Misfire

	Emissions in mg/km					
	Unmodified		Malfunction			
	152-11		152-21		152-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	6.91	0.62	9.83	2.39	15.73	3.42
Sulfates	0.74	0.34	0.20	0.04	0.28	0.08
Ammonia	9.26	10.99			6.78	10.49
Cyanides & Cyanogen	0.70	0.63	1.00	0.54	1.47	0.52
Hydrogen Sulfide	0	0.43	0	0	0	0
Aldehydes & Ketones						
Formaldehyde	3.16	1.99	4.27	1.00	4.82	1.44
Acetaldehyde	0	0.65	4.11	0	1.40	0.93
Acetone	0	0	0.99	0	0	0
Isobutyraldehyde	0	0	0	0	0	0
Methyl ethyl ketone	0.10	0	0.42	0	0	0
Crotonaldehyde	--	--	--	--	--	--
Hexanaldehyde	0.54	0.03	0	0	0.10	0.10
Benzaldehyde	--	--	--	--	--	--
Organic Sulfides						
Carbonyl sulfide	0.07	0.02	0.49	0.03	0.28	0.09
Methyl sulfide	0.04	0.31	0	0.01	0	0.01
Ethyl sulfide	<0.01	0.03	0	0	0	0
Methyl disulfide	0	0	0	0	0	0
Organic Amines						
Monomethylamine	0	0	0	0	0	0
Monoethylamine & dimethylamine	0.02	0.01	0	0.03	0	0
Trimethylamine	0	0	0	0	0	0
Diethylamine	0	0	0	0	0	0
Triethylamine	0	0	0	0	0	0

TABLE D-19. FTP INDIVIDUAL SAMPLE UNREGULATED EMISSIONS RESULTS
Test Series No. 153 - Disabled EGR

	Emissions in mg/km					
	Unmodified		Malfunction			
	153-11		153-21		153-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	7.38	4.40	12.46	7.01	9.71	6.83
Sulfates	0.46	0.80	0.40	0.14	0.23	0.18
Ammonia	3.78	1.71	1.59	2.79	2.66	2.55
Cyanides & Cyanogen	0.68	0	1.14	0	1.45	0
Hydrogen Sulfide	0	0.08	0	0	0	0
Aldehydes & Ketones						
Formaldehyde	2.42	1.39	3.22	3.38	4.89	3.63
Acetaldehyde	2.60	0.02	0.43	0	0	0
Acetone	0.69	0.16	0.07	0.07	0.25	0.43
Isobutyraldehyde	0	0	0	0	0	0
Methyl ethyl ketone	0.37	0.16	0.21	0.21	0.56	0.97
Crotonaldehyde	--	--	--	--	--	--
Hexanaldehyde	0.20	0.20	0	1.98	1.77	2.57
Benzaldehyde	--	--	--	--	--	--
Organic Sulfides						
Carbonyl sulfide	0	0	0.02	0.01	0.01	0
Methyl sulfide	0	0.04	0.09	0	<0.01	0
Ethyl sulfide	0	0	0	0	0	0
Methyl disulfide	0	0	0	0	0	0
Organic Amines						
Monomethylamine	0.01	0.02	0.01	0.03	0.03	0.09
Monoethylamine & dimethylamine	0	0	0	0	0	0
Trimethylamine	0	0	0	0.03	0	0
Diethylamine	0	0	0	0	0	0
Triethylamine	0	0	0	0	0	0

TABLE D-20. FTP INDIVIDUAL SAMPLE UNREGULATED EMISSIONS RESULTS

Test Series No. 154 - High Oil Consumption

	Emissions in mg/km					
	Unmodified		Malfunction			
	154-11		154-21		154-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	12.58	5.04	19.11	8.05	10.10	8.15
Sulfates	0.87	0.42	29.21	1.03	11.75	0.99
Ammonia	--	--	--	--	--	--
Cyanides & Cyanogen	--	--	--	--	--	--
Hydrogen Sulfide	0.10	0	0	0	0	0
Aldehydes & Ketones						
Formaldehyde	0.95	0	1.04	0	1.69	0
Acetaldehyde	0.91	0	1.10	1.59	0.91	0.04
Acetone	0.11	0	0.11	0.02	0.19	0.07
Isobutyraldehyde	0	0.18	0.10	0	0	0
Methyl ethyl ketone	0.21	0	0	0.09	0.20	0.16
Crotonaldehyde	--	--	--	--	--	--
Hexanaldehyde	0.10	0.10	0	0	0.25	0.20
Benzaldehyde	--	--	--	--	--	--
Organic Sulfides						
Carbonyl sulfide	0.52	0.35	1.16	0.21	0.58	0.21
Methyl sulfide	0.04	0.17	0.02	0.02	0.05	0.08
Ethyl sulfide	0	0	0.08	0	0.06	0
Methyl disulfide	0	0	0	0	0.01	0
Organic Amines						
Monomethylamine	0	0	0	0	0	0
Monoethylamine & dimethylamine	0	0	0	0	0	0
Trimethylamine	0	0	0	0	0.01	0.01
Diethylamine	0	0	0	0	0	0
Triethylamine	0	0	0	0	0	0

APPENDIX E

COMPUTER PRINTOUTS OF THE TEST DATA

	Car	Description
TABLES E-1 through E-12	11	1977 AMC Pacer
TABLES E-13 through E-24	12	1978 Chevrolet Malibu
TABLES E-25 through E-36	13	1978 Chev. Malibu (Calif.)
TABLES E-37 through E-48	14	1978 Ford Granada
TABLES E-49 through E-60	15	1978 Ford Mustang II

TABLE E-1. TEST 111 EMISSIONS RESULTS

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                    PVM - 111   FTP  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                     PROJECT 11-4771-001

TEST NO.   111-11   RUN   1           VEHICLE NO.     11               TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   77 AMC PACER          DATE    5/10/78                  ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
ENGINE 4.2 L(258 CID) L-6             BAG CART NO.  1                  GASOLINE  EM-399
TRANSMISSION A3                       DYNO NO.      3                  ODOMETER   1728 KM(  1074 MILES)
GVW  1962 KG(  4326 LBS)              CVS NO.       2

BAROMETER 746.25 MM HG(29.38 IN HG)   DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)
RELATIVE HUMIDITY 48 PCT              ABS. HUMIDITY  9.4 GM/KG         NOX HUMIDITY CORRECTION FACTOR   .96
BAG RESULTS
   BAG NUMBER                              1                  2                  3                  4
   DESCRIPTION                      COLD TRANSIENT       STABILIZED       HOT TRANSIENT        STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)      762.0 (30.0)       762.0 (30.0)       762.0 (30.0)       762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)    762.0 (30.0)       762.0 (30.0)       762.0 (30.0)       762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)   43.3 (110.0)       43.3 (110.0)       43.3 (110.0)       43.3 (110.0)
   BLOWER REVOLUTIONS                    40624              64548              40640              64506
   CVS FLOW STD. CU. METRES(SCF)       76.6 (2705.6)     131.2 (4634.4)      76.6 (2706.6)     131.0 (4628.6)
   HC  SAMPLE METER/RANGE/PPM        14.4/ 3/  144      50.0/ 2/   50      81.2/ 2/   81      42.8/ 2/   43
   HC  BCKGRD METER/RANGE/PPM         1.5/ 3/   15      14.1/ 2/   14      12.6/ 2/   13      13.2/ 2/   13
   CO  SAMPLE METER/RANGE/PPM        57.3/ 3/ 1431      83.0/12/  194      89.7/12/  215      47.9/12/  104
   CO  BCKGRD METER/RANGE/PPM          .4/ 3/    4       2.4/12/    4       1.2/12/    2       1.1/12/    2
   CO2 SAMPLE METER/RANGE/PCT        72.9/ 3/ 1.32      50.6/ 3/  .88      69.0/ 3/ 1.24      48.4/ 3/  .85
   CO2 BCKGRD METER/RANGE/PCT         4.4/ 3/  .08       4.6/ 3/  .07       4.3/ 3/  .07       4.4/ 3/  .08
   NOX SAMPLE METER/RANGE/PPM        46.2/ 2/   46      28.0/ 2/   28      50.1/ 2/   50      28.1/ 2/   28
   NOX BCKGRD METER/RANGE/PPM          .6/ 2/    1        .6/ 2/    1        .7/ 2/    1        .8/ 2/    1
   DILUTION FACTOR                         9.08              14.85              10.53              15.58

   HC  CONCENTRATION PPM                    131                 37                 70                 30
   CO  CONCENTRATION PPM                   1364                183                205                 99
   CO2 CONCENTRATION PCT                   1.26                .81               1.18                .78
   NOX CONCENTRATION PPM                   45.7               27.4               49.5               27.4
   HC  MASS GRAMS                          5.77               2.79               3.08               2.30
   CO  MASS GRAMS                        121.70              28.03              18.25              15.11
   CO2 MASS GRAMS                        1762.4             1953.2             1661.7             1860.9
   NOX MASS GRAMS                          6.41               6.60               6.95               6.57

   HC  GRAMS/KM                             .99                .45                .53                .37
   CO  GRAMS/KM                           20.92               4.52               3.15               2.44
   CO2 GRAMS/KM                           303.0              315.2              286.8              300.8
   NOX GRAMS/KM                            1.10               1.07               1.20               1.06
   FUEL CONSUMPTION BY CB L/100KM         14.97              13.82              12.53              13.05

   RUN TIME              SECONDS            505                867                506                867
   AVG. EXH. OXYGEN      PERCENT           6.50               6.55               6.55               6.50
   CATALYST AVG. TEMP.   DEG. C              -                  -                  -                  -
   CATALYST MAX. TEMP.   DEG. C              -                  -                  -                  -
   MEASURED DISTANCE     KM                5.82               6.20               5.79               6.19
        DFC, WET (DRY)                             .913 ( .904)                           .924 ( .916)
        SCF, WET (DRY)                            1.000 ( .981)                          1.000 ( .982)
        VOL (SCM)                                        207.8                                  207.7
        KM  (MEASURED)                                   12.01                                  11.98

COMPOSITE RESULTS                                                                         3-BAG        (4-BAG)
   TEST NUMBER             111-11    TOTAL FUEL SULFUR   MG/KM    27.45   CARBON DIOXIDE       G/KM      304.9     ( 300.6)
   BAROMETER      MM HG    746.3     AVG. EXH. OXYGEN    PCT       6.55   FUEL CONSUMPTION     L/100KM   13.60     ( 13.37)
   HUMIDITY       G/KG       9.4     CATALYST AVG. TEMP. DEG C      -     HYDROCARBONS (THC)   G/KM        .59     (   .56)
   TEMPERATURE    DEG C     24.4     CATALYST MAX. TEMP. DEG C      -     CARBON MONOXIDE      G/KM       7.56     (  6.95)
                                                                          OXIDES OF NITROGEN   G/KM       1.11     (  1.11)
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                    PVM - 111   SET  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                     PROJECT 11-4771-001

                                      VEHICLE NO.     11                 TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   77 AMC PACER          TRANSMISSION A3                    ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
ENGINE 4.2 L(258 CID) L-6             GVW  1962 KG(  4326 LBS)           GASOLINE  EM-399

   TEST NUMBER                         111-12                    111-13
   TEST CYCLE                          SET                       HFET
   RUN NUMBER                           1                         1
   DATE                               5/10/78                   5/10/78
   ODOMETER                          1744KM(  1084MILES)       1777KM(  1104MILES)
   CVS - BAG CART - DYNAMOMETER       2 - 1 - 3                 2 - 1 - 3

   TEMPERATURE DEG. C (DEG. F)        23.3 / 74.0               23.9 / 75.0
   RELATIVE HUMIDITY, PCT              50.7                      47.8
   BAROMETER, MM HG(IN HG)            742.2 (29.22)             742.2 (29.22)
   RUN TIME, SECONDS                   1398                       766

   BLOWER DIF P MM. H2O(IN. H2O)      762.0 (30.0)              762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)    762.0 (30.0)              762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)   43.9 (111.0)              43.9 (111.0)
   BLOWER REVOLUTIONS                  112129                     61995
   CVS FLOW STD. CU. METRES(SCF)      209.9 (7414.8)            115.1 (4066.4)
   HC  SAMPLE METER/RANGE/PPM        61.4/ 2/   61             73.9/ 2/   74
   HC  BCKGRD METER/RANGE/PPM        12.9/ 2/   13             14.3/ 2/   14
   CO  SAMPLE METER/RANGE/PPM        78.5/12/  181             91.5/12/  221
   CO  BCKGRD METER/RANGE/PPM         1.2/12/    2              1.4/12/    2
   CO2 SAMPLE METER/RANGE/PCT        85.2/ 3/ 1.58             93.7/ 2/ 1.93
   CO2 BCKGRD METER/RANGE/PCT         3.5/ 3/  .05              1.8/ 2/  .07
   NOX SAMPLE METER/RANGE/PPM        70.5/ 2/   70             37.2/ 3/  112
   NOX BCKGRD METER/RANGE/PPM          .3/ 2/    0               .4/ 3/    1
   HC  CONCENTRATION PPM                 50                        62
   CO  CONCENTRATION PPM                170                       207
   CO2 CONCENTRATION PCT               1.53                      1.88
   NOX CONCENTRATION PPM               70.2                     110.6
   HC  MASS GRAMS                      6.06                      4.10
   CO  MASS GRAMS                     41.66                     27.82
   CO2 MASS GRAMS                    5884.5                    3963.0
   NOX MASS GRAMS                     26.92                     23.08
        DFC, WET (DRY)              .881 ( .872)              .853 ( .846)
        SCF, WET (DRY)             1.000 ( .975)             1.000 ( .973)
        VOL (SCM)                     209.9                     115.1
        KM  (MEASURED)                21.83                     16.52

   TEST NUMBER,            PVMT       111-12                    111-13
   BAROMETER,              MM HG      742.2                     742.2
   HUMIDITY,               G/KG         9.3                       9.0
   TEMPERATURE,            DEG C       23.3                      23.9
   TOTAL FUEL SULFUR,      MG/KM      23.99                     21.34

   AVG. EXH. OXYGEN,       PCT         5.70                      4.30
   CATALYST AVG. TEMP.,    DEG C        -                         -
   CATALYST MAX. TEMP.,    DEG C        -                         -
   CARBON DIOXIDE,         G/KM       269.6                     239.8
   FUEL CONSUMPTION,       L/100KM    11.67                     10.39

   HYDROCARBONS,           G/KM         .28                       .25
   CARBON MONOXIDE,        G/KM        1.91                      1.68
   OXIDES OF NITROGEN,     G/KM        1.23                      1.40
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TABLE E-2. TEST 111 EMISSIONS RESULTS

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                         PVM - 111   FTP   VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
                                           PROJECT 11-4771-001

TEST NO.   111-21   RUN  1
VEHICLE MODEL    77 AMC PACER              VEHICLE NO.   11
ENGINE 4.2 L(258 CID) L-6                  DATE     9/15/78                 TEST WEIGHT    1588 KG(  3500 LBS)
TRANSMISSION A3                            BAG CART NO.  1                  ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
GVW  1962 KG(  4326 LBS)                   DYNO NO.      3                  GASOLINE  EM-349
                                           CVS NO.       2                  ODOMETER   2111 KM(  1312 MILES)

BAROMETER 737.62 MM HG(29.04 IN HG)        DRY BULB TEMP. 22.8 DEG C(73.0 DEG F)
RELATIVE HUMIDITY 50 PCT                   ABS. HUMIDITY  8.9 GM/KG
BAG RESULTS                                                                    NOX HUMIDITY CORRECTION FACTOR   .95
   BAG NUMBER                                   1                   2                  3                    4
   DESCRIPTION                             COLD TRANSIENT       STABILIZED        HOT TRANSIENT         STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)           762.0 (30.0)       762.0 (30.0)      762.0 (30.0)        762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)         762.0 (30.0)       762.0 (30.0)      762.0 (30.0)        762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)        43.9 (111.0)       43.9 (111.0)      43.3 (110.0)        43.3 (110.0)
   BLOWER REVOLUTIONS                          40693              69606              40679               69502
   CVS FLOW STD. CU. METRES(SCF)            75.7 (2673.4)     129.4 (4572.0)     75.7 (2674.6)      129.4 (4569.3)
   HC   SAMPLE METER/RANGE/PPM             22.3/ 3/  223      47.2/ 2/   47     19.0/ 3/  190       42.8/ 2/   43
   HC   BCKGRD METER/RANGE/PPM              1.5/ 3/   15      16.3/ 2/   16      1.7/ 3/   17       15.2/ 2/   15
   CO   SAMPLE METER/RANGE/PPM             57.5/ 2/ 2878      29.3/ 3/  684     35.5/ 3/  839       26.3/ 3/  611
   CO   BCKGRD METER/RANGE/PPM               .1/ 2/    4        .3/ 3/    7       .4/ 3/    4         .3/ 3/    7
   CO2  SAMPLE METER/RANGE/PCT             75.0/ 3/ 1.37      86.4/ 3/  .99     71.2/ 3/ 1.29       53.3/ 3/  .93
   CO2  BCKGRD METER/RANGE/PCT              4.6/ 3/  .07       3.8/ 3/  .06      3.3/ 3/  .05        3.6/ 3/  .06
   NOX  SAMPLE METER/RANGE/PPM             45.4/ 2/   48      38.7/ 2/   39     57.4/ 2/   57       29.2/ 2/   29
   NOX  BCKGRD METER/RANGE/PPM               .8/ 2/    1        .7/ 2/    1       .8/ 2/    1         .8/ 2/    1
   DILUTION FACTOR                              8.05              12.61              9.69               13.98

   HC   CONCENTRATION PPM                        210                 32                125                  29
   CO   CONCENTRATION PPM                       2753                659                796                 584
   CO2  CONCENTRATION PCT                       1.30                .94               1.24                 .88
   NOX  CONCENTRATION PPM                       44.7               33.1               56.7                33.5
   HC   MASS GRAMS                              9.16               2.40               5.49                2.14
   CO   MASS GRAMS                            242.63              98.55              70.23               87.99
   CO2  MASS GRAMS                            1800.3             2223.9             1729.2              2084.9
   NOX  MASS GRAMS                              6.11               7.73               7.75                7.82

   HC   GRAMS/KM                                1.58                .39                .95                 .35
   CO   GRAMS/KM                               41.82              16.08              12.12               14.38
   CO2  GRAMS/KM                               311.7              363.0              298.9               340.9
   NOX  GRAMS/KM                                1.05               1.26               1.35                1.28
   FUEL CONSUMPTION BY CB L/100KM              16.38              16.63              13.78               15.56

   RUN TIME                 SECONDS              505                867                506                 866
   AVG. EXH. OXYGEN         PERCENT             0.00               3.90               4.95                3.85
   CATALYST AVG. TEMP.      DEG. C                 -                  -                  -                   -
   CATALYST MAX. TEMP.      DEG. C                 -                  -                  -                   -
   MEASURED DISTANCE        KM                  5.80               6.13               5.79                6.12
        DFC. WET (DRY)                                 .909 ( .895)                          .915 ( .906)
        SCF. WET (DRY)                                1.000 ( .980)                         1.000 ( .980)
        VOL (SCM)                                            205.1                                 205.1
        KM  (MEASURED)                                       11.93                                 11.91

COMPOSITE RESULTS
   TEST NUMBER             111-21
   BAROMETER     MM HG      737.6     TOTAL FUEL SULFUR    MG/KM   32.41     CARBON DIOXIDE        G/KM      3-BAG      (4-BAG)
   HUMIDITY      G/KG         8.9     AVG. EXH. OXYGEN     PCT        -      FUEL CONSUMPTION      L/100KM   339.4     ( 328.4)
   TEMPERATURE   DEG C       22.8     CATALYST AVG. TEMP. DEG C       -      HYDROCARBONS (THC)    G/KM      15.77     ( 15.46)
                                      CATALYST MAX. TEMP. DEG C       -      CARBON MONOXIDE       G/KM        .79     (   .78)
                                                                             OXIDES OF NITROGEN    G/KM      20.40     ( 19.90)
                                                                                                              1.24     (  1.25)
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                         PVM - 111   SET   VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
                                           PROJECT 11-4771-001

VEHICLE MODEL    77 AMC PACER              VEHICLE NO.      11
ENGINE 4.2 L(258 CID) L-6                  TRANSMISSION A3                     TEST WEIGHT    1588 KG(  3500 LBS)
                                           GVW  1962 KG(  4326 LBS)            ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
                                                                               GASOLINE  EM-349
   TEST NUMBER                                111-22
   TEST CYCLE                                  SET                  111-23
   RUN NUMBER                                   1                    HFET
   DATE                                      9/19/78                   1
   ODOMETER                                                         9/19/78
   CVS - BAG CART - DYNAMOMETER        2161KM(  1343MILES)    2182KM(  1356MILES)
                                            2 - 1 - 3              2 - 1 - 3
   TEMPERATURE DEG. C (DEG. F)
   RELATIVE HUMIDITY, PCT                  26.1 / 79.0            26.1 / 79.0
   BAROMETER, MM HG(IN HG)                     40.3                   43.8
   RUN TIME, SECONDS                      736.6 (29.00)          736.6 (29.00)
                                               1346                    765
   BLOWER DIF P MM. H2O(IN. H2O)
   BLOWER INLET P MM. H2O(IN. H2O)         762.0 (30.0)           762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)       762.0 (30.0)           762.0 (30.0)
   BLOWER REVOLUTIONS                       43.9 (111.0)           43.9 (111.0)
   CVS FLOW STD. CU. METRES(SCF)              112164                  61534
   HC   SAMPLE METER/RANGE/PPM           208.3 (7356.2)         114.3 (4036.0)
   HC   BCKGRD METER/RANGE/PPM           55.0/ 2/   55          73.6/ 2/   74
   CO   SAMPLE METER/RANGE/PPM           11.7/ 2/   12          12.9/ 2/   13
   CO   BCKGRD METER/RANGE/PPM           23.8/ 3/  543          34.2/11/  326
   CO2  SAMPLE METER/RANGE/PCT             .1/ 3/    2           1.1/11/    3
   CO2  BCKGRD METER/RANGE/PCT           84.3/ 3/ 1.66          95.2/ 2/ 2.02
   NOX  SAMPLE METER/RANGE/PPM            3.4/ 3/  .06           1.3/ 2/  .05
   NOX  BCKGRD METER/RANGE/PPM           73.4/ 2/   74          38.5/ 3/  115
   HC   CONCENTRATION PPM                  .4/ 2/    1            .4/ 3/    1
   CO   CONCENTRATION PPM                       45                     65
   CO2  CONCENTRATION PCT                      517                    306
   NOX  CONCENTRATION PPM                      1.61                   1.98
   HC   MASS GRAMS                             73.1                  114.5
   CO   MASS GRAMS                             5.38                   4.26
   CO2  MASS GRAMS                           125.33                  40.67
   NOX  MASS GRAMS                           6146.2                 4135.6
        DFC. WET (DRY)                        27.94                  24.09
        SCF. WET (DRY)                    .878 ( .866)           .887 ( .880)
        VOL (SCM)                        1.000 ( .978)          1.000 ( .974)
        KM  (MEASURED)                        208.3                  114.3
                                              21.70                  16.26
   TEST NUMBER,            PVMT
   BAROMETER,              MM HG             111-22                 111-23
   HUMIDITY,               G/KG               736.6                  736.6
   TEMPERATURE,            DEG C                8.8                    9.5
   TOTAL FUEL SULFUR,      MG/KM               26.1                   26.1
                                              25.71                  22.73
   AVG. EXH. OXYGEN,       PCT
   CATALYST AVG. TEMP.,    DEG C               4.15                   4.65
   CATALYST MAX. TEMP.,    DEG C                 -                      -
   CARBON DIOXIDE,         G/KM                  -                      -
   FUEL CONSUMPTION,       L/100KM            283.2                  259.3
                                              12.51                  11.86
   HYDROCARBONS,           G/KM
   CARBON MONOXIDE,        G/KM                 .25                    .26
   OXIDES OF NITROGEN,     G/KM                5.78                   2.50
                                               1.29                   1.48
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TABLE E-3. TEST 111 EMISSIONS RESULTS

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                          PVM - 111   FTP  VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
                                           PROJECT 11-4771-001

TEST NO.   111-31   RUN   1                  VEHICLE NO.   11                  TEST WEIGHT    1588 KG(  3500 LBS)
VEHICLE MODEL    77 AMC PACER                DATE    5/16/78                   ACTUAL ROAD LOAD    9.2 KW( 12.3 HP)
ENGINE 4.2 L(258 CID) L-6                    BAG CART NO.  1                   GASOLINE  EM-399
TRANSMISSION A3                              DYNO NO.      3                   ODOMETER    2200 KM(  1367 MILES)
GVW  1968 KG(  4336 LBS)                     CVS NO.       2

BAROMETER 732.54 MM HG(28.84 IN HG)          DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)
RELATIVE HUMIDITY 55 PCT                     ABS. HUMIDITY 10.1 GM/KG          NOX HUMIDITY CORRECTION FACTOR   .98
BAG RESULTS
   BAG NUMBER                                      1                 2                  3                  4
   DESCRIPTION                              COLD TRANSIENT      STABILIZED        HOT TRANSIENT       STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)             762.0 (30.0)      762.0 (30.0)      762.0 (30.0)      762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)           762.0 (30.0)      762.0 (30.0)      762.0 (30.0)      762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)          43.9 (111.0)      43.9 (111.0)      43.9 (111.0)      43.3 (110.0)
   BLOWER REVOLUTIONS                            40644             69681             40606             69515
   CVS FLOW STD. CU. METRES(SCF)              75.1 (2652.9)    128.6 (4542.3)     74.9 (2647.0)    128.9 (4552.0)
   HC   SAMPLE METER/RANGE/PPM              24.3/ 3/  243     50.5/ 2/   50     13.9/ 3/  139     45.3/ 2/   45
   HC   BCKGRD METER/RANGE/PPM               1.0/ 3/   10     17.2/ 2/   17      1.0/ 3/   10     20.8/ 2/   21
   CO   SAMPLE METER/RANGE/PPM              54.9/ 2/ 3093     32.1/ 3/  753     33.9/ 3/  798     26.9/ 3/  625
   CO   BCKGRD METER/RANGE/PPM                .3/ 2/   11       .4/ 3/    9       .6/ 3/   14       .2/ 3/    5
   CO2  SAMPLE METER/RANGE/PCT              73.7/ 3/ 1.38     58.2/ 3/ 1.03     64.8/ 3/ 1.26     55.2/ 3/  .97
   CO2  BCKGRD METER/RANGE/PCT               4.9/ 3/  .07      5.2/ 3/  .08      4.9/ 3/  .08      4.7/ 3/  .07
   NOX  SAMPLE METER/RANGE/PPM              39.3/ 2/   39     29.3/ 2/   29     54.9/ 2/   54     32.6/ 2/   33
   NOX  BCKGRD METER/RANGE/PPM               1.0/ 2/    1       .8/ 2/    1      1.4/ 2/    1      1.2/ 2/    1
   DILUTION FACTOR                                7.90             12.13              9.98              12.97

   HC   CONCENTRATION PPM                         227                35               123                26
   CO   CONCENTRATION PPM                         2848               717               753               599
   CO2  CONCENTRATION PCT                         1.32               .95              1.19               .90
   NOX  CONCENTRATION PPM                         38.4              28.6              53.1              31.5
   HC   MASS GRAMS                                9.86              2.58              5.31              1.93
   CO   MASS GRAMS                              253.51            107.37             65.71             84.50
   CO2  MASS GRAMS                              1818.2            2246.3            1636.4            2120.0
   NOX  MASS GRAMS                                5.91              6.89              7.47              7.59

   HC   GRAMS/KM                                  1.70               .42               .91               .32
   CO   GRAMS/KM                                 43.78             17.35             11.30             13.61
   CO2  GRAMS/KM                                 314.0             363.0             281.9             346.2
   NOX  GRAMS/KM                                   .93              1.11              1.28              1.29
   FUEL CONSUMPTION BY CB L/100KM                16.57             16.71             12.84             15.80

   RUN TIME            SECONDS                     505               867               505               866
   AVG. EXH. OXYGEN    PERCENT                    5.25              3.85              5.65              3.60
   CATALYST AVG. TEMP.  DEG. C                      -                 -                 -                 -
   CATALYST MAX. TEMP.  DEG. C                      -                 -                 -                 -
   MEASURED DISTANCE   KM                         5.79              6.19              5.81              6.12
         DFC, WET (DRY)                                  .901 ( .891)                        .914 ( .904)
         SCF, WET (DRY)                                 1.000 ( .978)                       1.000 ( .979)
         VOL (SCM)                                            203.7                               203.9
         KM  (MEASURED)                                       11.98                               11.99

COMPOSITE RESULTS                                                                                     3-BAG        (4-BAG)
   TEST NUMBER          111-31      TOTAL FUEL SULFUR    MG/KM    32.12    CARBON DIOXIDE       G/KM      330.1      ( 325.2)
   BAROMETER     MM HG  732.5       AVG. EXH. OXYGEN     PCT       4.25    FUEL CONSUMPTION     L/100KM    15.63      ( 15.36)
   HUMIDITY      G/KG    10.1       CATALYST AVG. TEMP. DEG C       -      HYDROCARBONS (THC)   G/KM        .82      (   .79)
   TEMPERATURE   DEG C   23.3       CATALYST MAX. TEMP. DEG C       -      CARBON MONOXIDE      G/KM      21.17      ( 20.36)
                                                                           OXIDES OF NITROGEN   G/KM       1.12      (  1.16)
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                          PVM - 111   SET  VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
                                           PROJECT 11-4771-001

                                          VEHICLE NO.      11                  TEST WEIGHT    1588 KG(  3500 LBS)
VEHICLE MODEL    77 AMC PACER             TRANSMISSION A3                      ACTUAL ROAD LOAD    9.2 KW( 12.3 HP)
ENGINE 4.2 L(258 CID) L-6                 GVW  1968 KG(  4336 LBS)             GASOLINE  EM-399

   TEST NUMBER                                111-32                 111-33
   TEST CYCLE                                  SET                    HFET
   RUN NUMBER                                   1                      1
   DATE                                      5/16/78                5/16/78                         / /
   ODOMETER                            2231KM(  1386MILES)     2251KM(  1399MILES)
   CVS - BAG CART - DYNAMOMETER               2 - 1 - 3              2 - 1 - 3

   TEMPERATURE DEG. C (DEG. F)              26.1 / 79.0            26.7 / 80.0
   RELATIVE HUMIDITY, PCT                      40.8                   38.4
   BAROMETER, MM HG(IN HG)                 732.5 (28.84)          734.1 (28.90)
   RUN TIME, SECONDS                           1397                   765

   BLOWER DIF P MM. H2O(IN. H2O)           762.0 (30.0)           762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)         762.0 (30.0)           762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)        43.3 (110.0)           43.3 (110.0)
   BLOWER REVOLUTIONS                         112197                  61611
   CVS FLOW STD. CU. METRES(SCF)          207.3 (7320.5)         113.7 (4016.0)
   HC   SAMPLE METER/RANGE/PPM            70.8/ 2/   71          81.1/ 2/   81
   HC   BCKGRD METER/RANGE/PPM            18.4/ 2/   18          18.6/ 2/   19
   CO   SAMPLE METER/RANGE/PPM            25.3/ 3/  587          73.7/11/  382
   CO   BCKGRD METER/RANGE/PPM              .1/ 3/    2           1.0/11/    5
   CO2  SAMPLE METER/RANGE/PCT            87.5/ 3/ 1.63          46.8/ 2/ 2.05
   CO2  BCKGRD METER/RANGE/PCT             4.0/ 3/  .06           1.4/ 2/  .07
   NOX  SAMPLE METER/RANGE/PPM            73.0/ 2/   74          37.2/ 3/  112
   NOX  BCKGRD METER/RANGE/PPM             1.1/ 2/    1            .4/ 3/    1
   HC   CONCENTRATION PPM                       55                     65
   CO   CONCENTRATION PPM                       558                    361
   CO2  CONCENTRATION PCT                       1.57                   1.99
   NOX  CONCENTRATION PPM                       72.8                  110.6
   HC   MASS GRAMS                              6.54                   4.29
   CO   MASS GRAMS                            134.79                  39.07
   CO2  MASS GRAMS                            5967.7                 4199.0
   NOX  MASS GRAMS                             27.26                  22.58
         DFC, WET (DRY)                     .874 ( .860)           .844 ( .834)
         SCF, WET (DRY)                    1.000 ( .970)          1.000 ( .975)
         VOL (SCM)                             207.3                  113.7
         KM  (MEASURED)                        21.62                  16.30

   TEST NUMBER,          PVMT                 111-32                 111-33
   BAROMETER,            MM HG                 732.5                  734.1
   HUMIDITY,             G/KG                    8.4                    8.6
   TEMPERATURE,          DEG C                  26.1                   26.7
   TOTAL FUEL SULFUR,    MG/KM                 25.16                  22.61

   AVG. EXH. OXYGEN,     PCT                    4.15                   4.00
   CATALYST AVG. TEMP.,  DEG C                    -                      -
   CATALYST MAX. TEMP.,  DEG C                    -                      -
   CARBON DIOXIDE,       G/KM                  276.1                  253.1
   FUEL CONSUMPTION,     L/100KM               12.24                  11.00

   HYDROCARBONS,         G/KM                    .30                    .26
   CARBON MONOXIDE,      G/KM                   6.24                   2.43
   OXIDES OF NITROGEN,   G/KM                   1.26                   1.38
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TABLE E-4. TEST 112 EMISSIONS RESULTS

```
                        PVM - 112   FTP   VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                          PROJECT 11-4771-001

TEST NO.   112-11   RUN   1                 VEHICLE NO.   11                    TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   77 AMC PACER                DATE    6/30/78                     ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
ENGINE 4.2 L(258 CID) L-6                   BAG CART NO.  1                     GASOLINE  EM-344
TRANSMISSION A3                             DYNO NO.      2                     ODOMETER   4062 KM(  2524 MILES)
GVW  1962 KG(  4326 LBS)                    CVS NO.       2

BAROMETER 741.93 MM HG(29.21 IN HG)         DRY BULB TEMP. 26.1 DEG C(79.0 DEG F)
RELATIVE HUMIDITY 57 PCT                    ABS. HUMIDITY 12.9 GM/KG
BAG RESULTS                                                                     NOX HUMIDITY CORRECTION FACTOR  1.06
  BAG NUMBER                                     1                  2                  3                  4
  DESCRIPTION                              COLD TRANSIENT       STABILIZED      HOT TRANSIENT        STABILIZED

  BLOWER DIF P MM. H2O(IN. H2O)            762.0 (30.0)       762.0 (30.0)       762.0 (30.0)       762.0 (30.0)
  BLOWER INLET P MM. H2O(IN. H2O)          762.0 (30.0)       762.0 (30.0)       762.0 (30.0)       762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)         43.3 (110.0)       43.3 (110.0)       43.3 (110.0)       43.3 (110.0)
  BLOWER REVOLUTIONS                           40644              69627              40264              69609
  CVS FLOW STD. CU. METRES(SCF)             76.3 (2694.0)     130.6 (4612.0)      75.5 (2667.9)     130.5 (4610.6)
  HC  SAMPLE METER/RANGE/PPM              17.6/ 3/  176      59.3/ 2/   59      10.8/ 3/  108      51.8/ 2/   52
  HC  BCKGRD METER/RANGE/PPM               2.0/ 3/   20      12.6/ 2/   13       1.2/ 3/   12      11.1/ 2/   11
  CO  SAMPLE METER/RANGE/PPM              73.0/ 3/ 1920      73.7/11/  322      43.3/11/  474      60.6/11/  243
  CO  BCKGRD METER/RANGE/PPM                .4/ 3/    4       2.6/11/    8       2.4/11/    7       1.4/11/    6
  CO2 SAMPLE METER/RANGE/PCT              76.4/ 3/ 1.41      53.2/ 3/  .43      72.3/ 3/ 1.31      51.4/ 3/  .90
  CO2 BCKGRD METER/RANGE/PCT               3.5/ 3/  .05       4.2/ 3/  .06       5.1/ 3/  .08       4.7/ 3/  .07
  NOX SAMPLE METER/RANGE/PPM              46.0/ 2/   46      39.2/ 2/   39      53.6/ 2/   54      39.6/ 2/   39
  NOX BCKGRD METER/RANGE/PPM                .9/ 2/    1       1.0/ 2/    1       1.5/ 2/    2       1.2/ 2/    1
  DILUTION FACTOR                              8.39              13.87               9.88              14.37

  HC  CONCENTRATION PPM                         158                 48                 97                 41
  CO  CONCENTRATION PPM                        1885                303                447                229
  CO2 CONCENTRATION PCT                        1.36                .87               1.29                .84
  NOX CONCENTRATION PPM                        45.2               38.3               52.3               38.5
  HC  MASS GRAMS                               6.97               3.59               4.23               3.12
  CO  MASS GRAMS                             162.22              46.14              39.32              34.80
  CO2 MASS GRAMS                             1898.4             2078.7             1715.8             2000.8
  NOX MASS GRAMS                               6.98               8.74               7.98               8.84

  HC  GRAMS/KM                                 1.21                .59                .74                .51
  CO  GRAMS/KM                                28.20               7.53               6.84               5.68
  CO2 GRAMS/KM                                330.1              339.1              298.6              326.6
  NOX GRAMS/KM                                 1.21               1.43               1.39               1.44
  FUEL CONSUMPTION BY CB L/100KM              16.15              15.07              13.30              14.34

  RUN TIME                SECONDS               505                867                501                867
  AVG. EXH. OXYGEN        PERCENT              5.15               5.60               5.08               5.55
  CATALYST AVG. TEMP.     DEG. C                 -                  -                  -                  -
  CATALYST MAX. TEMP.     DEG. C                 -                  -                  -                  -
  MEASURED DISTANCE       KM                   5.75               6.13               5.75               6.12
       DFC, WET (DRY)                                 .910 ( .894)                          .919 ( .908)
       SCF, WET (DRY)                                1.000 ( .978)                         1.000 ( .978)
       VOL (SCM)                                          206.9                                 206.1
       KM  (MEASURED)                                     11.88                                 11.87

COMPOSITE RESULTS
  TEST NUMBER               112-11
  BAROMETER     MM HG        741.9    TOTAL FUEL SULFUR    MG/KM    31.73      CARBON DIOXIDE         G/KM        3-BAG     (4-BAG)
  HUMIDITY      G/KG          12.9    AVG. EXH. OXYGEN     PCT       5.42      FUEL CONSUMPTION       L/100KM     326.1     ( 322.4)
  TEMPERATURE   DEG C         26.1    CATALYST AVG. TEMP. DEG C       -        HYDROCARBONS (THC)     G/KM        14.88     ( 14.61)
                                      CATALYST MAX. TEMP. DEG C       -        CARBON MONOXIDE        G/KM          .76     (   .74)
                                                                               OXIDES OF NITROGEN     G/KM        11.65     ( 11.10)
                                                                                                                   1.38     (  1.38)


                        PVM - 112   SET   VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                          PROJECT 11-4771-001

VEHICLE MODEL   77 AMC PACER                VEHICLE NO.    11                   TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 4.2 L(258 CID) L-6                   TRANSMISSION A3                     ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
                                            GVW  1962 KG(  4326 LBS)            GASOLINE  EM-344
  TEST NUMBER
  TEST CYCLE                                  112-12                   112-13
  RUN NUMBER                                   SET                      HFET
  DATE                                          1                        1
  ODOMETER                                   6/26/78                  6/26/78
  CVS - BAG CART - DYNAMOMETER          3940KM(  2448MILES)      3946KM(  2452MILES)                 /  /
                                              2 - 1 - 3                2 - 1 - 3
  TEMPERATURE DEG. C (DEG. F)
  RELATIVE HUMIDITY, PCT                    25.6 / 78.0              28.3 / 83.0
  BAROMETER, MM HG(IN HG)                       46.4                     43.3
  RUN TIME, SECONDS                        737.9 (29.05)            737.9 (29.05)
                                                1399                      764
  BLOWER DIF P MM. H2O(IN. H2O)
  BLOWER INLET P MM. H2O(IN. H2O)          736.6 (29.0)             736.6 (29.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)        736.6 (29.0)             736.6 (29.0)
  BLOWER REVOLUTIONS                        43.3 (110.0)             43.9 (111.0)
  CVS FLOW STD. CU. METRES(SCF)                112285                    61953
  HC  SAMPLE METER/RANGE/PPM              210.1 (7419.7)           115.8 (4091.8)
  HC  BCKGRD METER/RANGE/PPM              67.5/ 2/   68            82.6/ 2/   83
  CO  SAMPLE METER/RANGE/PPM               5.7/ 2/    6             6.1/ 2/    6
  CO  BCKGRD METER/RANGE/PPM              83.3/11/  391            70.4/11/  355
  CO2 SAMPLE METER/RANGE/PCT               1.1/11/    3             1.7/11/    5
  CO2 BCKGRD METER/RANGE/PCT              83.7/ 3/ 1.55            44.1/ 2/ 1.96
  NOX SAMPLE METER/RANGE/PPM               3.4/ 3/  .06             1.8/ 2/  .07
  NOX BCKGRD METER/RANGE/PPM              66.1/ 2/   66            32.8/ 3/   98
  HC  CONCENTRATION PPM                    2.2/ 2/    2              .6/ 3/    2
  CO  CONCENTRATION PPM                          62                       77
  CO2 CONCENTRATION PCT                         370                      332
  NOX CONCENTRATION PPM                        1.49                     1.90
  HC  MASS GRAMS                               64.2                     96.4
  CO  MASS GRAMS                               7.57                     5.17
  CO2 MASS GRAMS                              90.59                    44.78
  NOX MASS GRAMS                             5797.0                   4033.2
       DFC, WET (DRY)                         24.99                    21.48
       SCF, WET (DRY)                      .881 ( .874)             .851 ( .844)
       VOL (SCM)                          1.000 ( .977)            1.000 ( .974)
       KM  (MEASURED)                         210.1                    115.8
                                              21.79                    16.37
  TEST NUMBER,            PVMT
  BAROMETER,              MM HG               112-12                   112-13
  HUMIDITY,               G/KG                737.9                    737.9
  TEMPERATURE,            DEG C                 9.8                     10.7
  TOTAL FUEL SULFUR,      MG/KM                25.6                     28.3
                                              24.88                    23.02
  AVG. EXH. OXYGEN,       PCT
  CATALYST AVG. TEMP.,    DEG C                4.88                     4.66
  CATALYST MAX. TEMP.,    DEG C                  -                        -
  CARBON DIOXIDE,         G/KM                   -                        -
  FUEL CONSUMPTION,       L/100KM             266.3                    246.3
                                              11.61                    10.74
  HYDROCARBONS,           G/KM
  CARBON MONOXIDE,        G/KM                  .35                      .32
  OXIDES OF NITROGEN,     G/KM                 4.17                     2.73
                                               1.15                     1.31
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TABLE E-5. TEST 112 EMISSIONS RESULTS

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                              PVM - 112   FTP   VEHICLE EMISSIONS RESULTS - IGNITION MISFIRE
                                                PROJECT 11-4771-001

TEST NO.   112-21   RUN   1                     VEHICLE NO.   11                      TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   77 AMC PACER                    DATE    7/ 7/78                       ACTUAL ROAD LOAD    9.2 KW( 12.3 HP)
ENGINE 4.2 L(258 CID) L-6                       BAG CART NO.  1                       GASOLINE  EM-344
TRANSMISSION A3                                 DYNO NO.      3                       ODOMETER    4405 KM(  2737 MILES)
GVW  1962 KG(  4326 LBS)                        CVS NO.       2

BAROMETER 742.44 MM HG(29.23 IN HG)             DRY BULB TEMP. 27.2 DEG C(81.0 DEG F)
RELATIVE HUMIDITY 48 PCT                        ABS. HUMIDITY 11.1 GM/KG              NOX HUMIDITY CORRECTION FACTOR  1.01
BAG RESULTS
   BAG NUMBER                                        1                  2                  3                  4
   DESCRIPTION                                COLD TRANSIENT      STABILIZED        HOT TRANSIENT       STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)              762.0 (30.0)       762.0 (30.0)       762.0 (30.0)       762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)            762.0 (30.0)       762.0 (30.0)       762.0 (30.0)       762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)           43.3 (110.0)       43.3 (110.0)       43.9 (111.0)       43.3 (110.0)
   BLOWER REVOLUTIONS                            40651              69578              40618              69271
   CVS FLOW STD. CU. METRES(SCF)               76.3 (2695.0)     130.6 (4612.0)      76.2 (2690.1)     130.0 (4591.7)
   HC  SAMPLE METER/RANGE/PPM                16.0/ 4/ 1600      44.2/ 3/  442      13.1/ 4/ 1310      90.4/ 3/  904
   HC  BCKGRD METER/RANGE/PPM                  .2/ 4/   20       3.3/ 3/   33        .3/ 4/   30       4.0/ 3/   40
   CO  SAMPLE METER/RANGE/PPM                85.2/ 3/ 2349      82.5/11/  385      38.7/ 3/  844      66.6/11/  278
   CO  BCKGRD METER/RANGE/PPM                  .8/ 3/   18       4.4/11/   15        .6/ 3/   14       3.7/11/   11
   CO2 SAMPLE METER/RANGE/PCT                75.1/ 3/ 1.37      51.3/ 3/  .89      67.7/ 3/ 1.22      50.0/ 3/  .87
   CO2 BCKGRD METER/RANGE/PCT                 3.8/ 3/  .06       4.2/ 3/  .06       4.6/ 3/  .07       3.4/ 3/  .06
   NOX SAMPLE METER/RANGE/PPM                50.5/ 2/   50      45.3/ 2/   45      63.4/ 2/   63      47.1/ 2/   47
   NOX BCKGRD METER/RANGE/PPM                 2.5/ 2/    3       2.6/ 2/    3       3.0/ 2/    3       2.7/ 2/    3
   DILUTION FACTOR                                7.69              13.09               9.37              13.61

   HC  CONCENTRATION PPM                         1583                412               1283                867
   CO  CONCENTRATION PPM                         2235                358                799                258
   CO2 CONCENTRATION PCT                         1.32                .83               1.15                .81
   NOX CONCENTRATION PPM                         48.3               42.4               60.7               44.6
   HC  MASS GRAMS                               69.65              68.65              56.37              65.01
   CO  MASS GRAMS                              198.61              54.48              70.87              39.13
   CO2 MASS GRAMS                              1841.6             1991.2             1610.0             1932.5
   NOX MASS GRAMS                                7.15              10.86               8.97              11.29

   HC  GRAMS/KM                                 12.03              11.07               9.75              10.70
   CO  GRAMS/KM                                 34.31               8.79              12.26               6.44
   CO2 GRAMS/KM                                 318.1              321.1              278.4              318.1
   NOX GRAMS/KM                                  1.23               1.75               1.55               1.85
   FUEL CONSUMPTION BY CB L/100KM               17.51              15.79              14.03              15.96

   RUN TIME                 SECONDS               505                867                505                863
   AVG. EXH. OXYGEN         PERCENT              6.75               7.15               7.04               7.14
   CATALYST AVG. TEMP.      DEG. C                 -                  -                  -                  -
   CATALYST MAX. TEMP.      DEG. C                 -                  -                  -                  -
   MEASURED DISTANCE        KM                   5.79               6.20               5.78               6.08
        DFC, WET (DRY)                                    .904 ( .895)                          .914 ( .906)
        SCF, WET (DRY)                                   1.000 ( .981)                         1.000 ( .982)
        VOL (SCM)                                                206.9                                 206.2
        KM  (MEASURED)                                           11.99                                 11.86

COMPOSITE RESULTS                                                                                      3-BAG       (4-BAG)
   TEST NUMBER            112-21      TOTAL FUEL SULFUR   MG/KM   33.57     CARBON DIOXIDE       G/KM      308.7     ( 307.7)
   BAROMETER      MM HG   742.4       AVG. EXH. OXYGEN    PCT      7.06     FUEL CONSUMPTION     L/100KM   15.66     ( 15.56)
   HUMIDITY       G/KG     11.1       CATALYST AVG. TEMP. DEG C     -       HYDROCARBONS (THC)   G/KM      10.91     ( 10.79)
   TEMPERATURE    DEG C    27.2       CATALYST MAX. TEMP. DEG C     -       CARBON MONOXIDE      G/KM      15.09     ( 14.36)
                                                                            OXIDES OF NITROGEN   G/KM       1.59     (  1.62)



                              PVM - 112   SET   VEHICLE EMISSIONS RESULTS - IGNITION MISFIRE
                                                PROJECT 11-4771-001

                                                VEHICLE NO.     11                    TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   77 AMC PACER                    TRANSMISSION A3                       ACTUAL ROAD LOAD    9.2 KW( 12.3 HP)
ENGINE 4.2 L(258 CID) L-6                       GVW  1962 KG(  4326 LBS)              GASOLINE  EM-344

   TEST NUMBER                                   112-22                  112-23
   TEST CYCLE                                     SET                     HFET
   RUN NUMBER                                      1                       1
   DATE                                         7/ 7/78                 7/ 7/78                       /  /
   ODOMETER                                 4435KM(  2756MILES)     4474KM(  2780MILES)
   CVS - BAG CART - DYNAMOMETER                 2 - 1 - 3               2 - 1 - 3

   TEMPERATURE DEG. C (DEG. F)                 27.8 / 82.0             29.4 / 85.0
   RELATIVE HUMIDITY, PCT                         45.6                    41.5
   BAROMETER, MM HG(IN HG)                   742.4 (29.23)           742.4 (29.23)
   RUN TIME, SECONDS                              1397                     766

   BLOWER DIF P MM. H2O(IN. H2O)              762.0 (30.0)            762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)            762.0 (30.0)            762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)           43.3 (110.0)            43.3 (110.0)
   BLOWER REVOLUTIONS                            112288                  62347
   CVS FLOW STD. CU. METRES(SCF)             210.7 (7443.6)          117.1 (4135.3)
   HC  SAMPLE METER/RANGE/PPM                19.3/ 4/ 1930           17.4/ 4/ 1740
   HC  BCKGRD METER/RANGE/PPM                  .1/ 4/   10             .1/ 4/   10
   CO  SAMPLE METER/RANGE/PPM                32.3/ 3/  758           32.4/ 3/  761
   CO  BCKGRD METER/RANGE/PPM                  .1/ 3/    2             .4/ 3/    4
   CO2 SAMPLE METER/RANGE/PCT                83.2/ 3/ 1.54           43.0/ 2/ 1.90
   CO2 BCKGRD METER/RANGE/PCT                 4.2/ 3/  .06            1.4/ 2/  .05
   NOX SAMPLE METER/RANGE/PPM                74.9/ 2/   75           35.7/ 3/  107
   NOX BCKGRD METER/RANGE/PPM                 2.4/ 2/    2            1.1/ 3/    3
   HC  CONCENTRATION PPM                          1921                    1732
   CO  CONCENTRATION PPM                           723                     715
   CO2 CONCENTRATION PCT                          1.48                    1.86
   NOX CONCENTRATION PPM                          72.8                   109.3
   HC  MASS GRAMS                               172.77                  116.93
   CO  MASS GRAMS                               177.37                   97.52
   CO2 MASS GRAMS                               5712.4                  3977.4
   NOX MASS GRAMS                                29.51                   23.52
        DFC, WET (DRY)                       .849 ( .842)            .840 ( .834)
        SCF, WET (DRY)                      1.000 ( .978)           1.000 ( .975)
        VOL (SCM)                                210.7                   117.1
        KM  (MEASURED)                           21.44                   16.19

   TEST NUMBER,          PVMT                   112-22                  112-23
   BAROMETER,            MM HG                  742.4                   742.4
   HUMIDITY,             G/KG                    10.4                    10.4
   TEMPERATURE,          DEG C                   27.8                    29.4
   TOTAL FUEL SULFUR,    MG/KM                  27.40                   25.43

   AVG. EXH. OXYGEN,     PCT                     6.14                    5.30
   CATALYST AVG. TEMP.,  DEG C                    -                       -
   CATALYST MAX. TEMP.,  DEG C                    -                       -
   CARBON DIOXIDE,       G/KM                   266.5                   245.7
   FUEL CONSUMPTION,     L/100KM                13.02                   11.07

   HYDROCARBONS,         G/KM                    8.06                    7.22
   CARBON MONOXIDE,      G/KM                    8.27                    6.02
   OXIDES OF NITROGEN,   G/KM                    1.38                    1.45
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TABLE E-6. TEST 112 EMISSIONS RESULTS

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                        PVM - 112   FTP   VEHICLE EMISSIONS RESULTS - IGNITION MISFIRE
                                          PROJECT 11-4771-001

TEST NO.   112-31   RUN   1                  VEHICLE NO.   11                      TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   77 AMC PACER                 DATE    7/10/78                       ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
ENGINE 4.2 L(258 CID) L-6                    BAG CART NO.  1                       GASOLINE  EM-344
TRANSMISSION A3                              DYNO NO.      3                       ODOMETER    4488 KM(  2789 MILES)
GVW  1962 KG(  4326 LBS)                     CVS NO.       2

BAROMETER 742.70 MM HG(29.24 IN HG)          DRY BULB TEMP. 21.1 DEG C(70.0 DEG F)
RELATIVE HUMIDITY 60 PCT                     ABS. HUMIDITY  9.6 GM/KG              NOX HUMIDITY CORRECTION FACTOR   .96
BAG RESULTS
   BAG NUMBER                                      1                  2                   3                    4
   DESCRIPTION                              COLD TRANSIENT       STABILIZED        HOT TRANSIENT          STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)            762.0 (30.0)       762.0 (30.0)       762.0 (30.0)         762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)          762.0 (30.0)       762.0 (30.0)       762.0 (30.0)         762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)         43.3 (110.0)       43.3 (110.0)       43.3 (110.0)         43.3 (110.0)
   BLOWER REVOLUTIONS                          40777              69659              40563                69636
   CVS FLOW STD. CU. METRES(SCF)             76.6 (2704.7)     130.8 (4619.0)      76.2 (2690.0)       130.7 (4617.7)
   HC  SAMPLE METER/RANGE/PPM               15.9/ 4/ 1590      91.0/ 3/  910      12.1/ 4/ 1210        88.9/ 3/  889
   HC  BCKGRD METER/RANGE/PPM                 .2/ 4/   20       2.5/ 3/   25       0.0/ 4/    0         3.5/ 3/   35
   CO  SAMPLE METER/RANGE/PPM               87.0/ 3/ 2417      71.5/11/  300      29.0/ 3/  677        62.7/11/  255
   CO  BCKGRD METER/RANGE/PPM                 .1/ 3/    2       1.9/11/    4        .1/ 3/    2          .6/11/    2
   CO2 SAMPLE METER/RANGE/PCT               79.0/ 3/ 1.35      56.1/ 3/  .87      66.9/ 3/ 1.19        48.9/ 3/  .84
   CO2 BCKGRD METER/RANGE/PCT                3.9/ 3/  .06       3.8/ 3/  .06       3.5/ 3/  .05         3.8/ 3/  .06
   NOX SAMPLE METER/RANGE/PPM               54.6/ 2/   55      52.8/ 2/   53      72.9/ 2/   73        53.6/ 2/   54
   NOX BCKGRD METER/RANGE/PPM                1.2/ 2/    1        .6/ 2/    1        .6/ 2/    1         1.6/ 2/    2
   DILUTION FACTOR                              7.72              13.54               9.73                14.11

   HC  CONCENTRATION PPM                        1573                887               1210                  856
   CO  CONCENTRATION PPM                        2305                293                646                  244
   CO2 CONCENTRATION PCT                        1.29                .82               1.14                  .78
   NOX CONCENTRATION PPM                        53.6               52.2               72.9                 52.1
   HC  MASS GRAMS                              69.46              66.89              53.15                64.59
   CO  MASS GRAMS                             205.58              44.69              57.29                37.22
   CO2 MASS GRAMS                             1814.5             1952.1             1594.3               1872.8
   NOX MASS GRAMS                               7.56              12.59              10.15                12.55

   HC  GRAMS/KM                                12.09              10.94               9.30                10.53
   CO  GRAMS/KM                                35.80               7.30              10.02                 6.07
   CO2 GRAMS/KM                                316.0              319.3              278.7                305.4
   NOX GRAMS/KM                                 1.32               2.06               1.78                 2.05
   FUEL CONSUMPTION BY CB L/100KM              17.52              15.60              13.84                14.87

   RUN TIME              SECONDS                 505                867                505                  867
   AVG. EXH. OXYGEN      PERCENT                6.10               7.11               6.16                 6.94
   CATALYST AVG. TEMP.   DEG. C                   -                  -                  -                    -
   CATALYST MAX. TEMP.   DEG. C                   -                  -                  -                    -
   MEASURED DISTANCE     KM                     5.74               6.11               5.72                 6.13
         DFC, WET (DRY)                                .906 ( .894)                          .917 ( .906)
         SCF, WET (DRY)                               1.000 ( .977)                         1.000 ( .978)
         VOL (SCM)                                          207.4                                 206.9
         KM  (MEASURED)                                     11.86                                 11.85

COMPOSITE RESULTS
   TEST NUMBER             112-31      TOTAL FUEL SULFUR   MG/KM    33.25                                        3-BAG        (4-BAG)
   BAROMETER     MM HG      742.7      AVG. EXH. OXYGEN    PCT       6.75       CARBON DIOXIDE        G/KM      307.5       ( 303.9)
   HUMIDITY      G/KG         9.6      CATALYST AVG. TEMP. DEG C      -         FUEL CONSUMPTION      L/100KM    15.51       ( 15.30)
   TEMPERATURE   DEG C       21.1      CATALYST MAX. TEMP. DEG C      -         HYDROCARBONS (THC)    G/KM       10.73       ( 10.61)
                                                                                CARBON MONOXIDE       G/KM       13.99       ( 13.62)
                                                                                OXIDES OF NITROGEN    G/KM        1.83       (  1.82)


                        PVM - 112   SET   VEHICLE EMISSIONS RESULTS - IGNITION MISFIRE
                                          PROJECT 11-4771-001

VEHICLE MODEL   77 AMC PACER                 VEHICLE NO.     11                    TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 4.2 L(258 CID) L-6                    TRANSMISSION A3                       ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
                                             GVW  1962 KG(  4326 LBS)              GASOLINE  EM-344

   TEST NUMBER
   TEST CYCLE                                   112-32               112-33
   RUN NUMBER                                    SET                  HFET
   DATE                                           1                    1
   ODOMETER                                    7/10/78              7/10/78                    / /
   CVS - BAG CART - DYNAMOMETER         4534KM(  2817MILES)   4556KM(  2831MILES)
                                               2 - 1 - 3            2 - 1 - 3
   TEMPERATURE DEG. C (DEG. F)
   RELATIVE HUMIDITY, PCT                    26.7 / 80.0          26.7 / 80.0
   BAROMETER, MM HG(IN HG)                      47.6                 40.6
   RUN TIME, SECONDS                        742.9 (29.25)        742.9 (29.25)
                                                1396                  765
   BLOWER DIF P MM. H2O(IN. H2O)
   BLOWER INLET P MM. H2O(IN. H2O)          762.0 (30.0)         762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)        762.0 (30.0)         762.0 (30.0)
   BLOWER REVOLUTIONS                        43.3 (110.0)         44.4 (112.0)
   CVS FLOW STD. CU. METRES(SCF)               112036                62130
   HC  SAMPLE METER/RANGE/PPM               210.3 (7426.4)       116.4 (4112.8)
   HC  BCKGRD METER/RANGE/PPM               19.6/ 4/ 1960        19.3/ 4/ 1930
   CO  SAMPLE METER/RANGE/PPM                0.0/ 4/    0          .2/ 4/   20
   CO  BCKGRD METER/RANGE/PPM               36.6/ 3/  867        52.6/ 3/ 1246
   CO2 SAMPLE METER/RANGE/PCT                 .2/ 3/    5          .3/ 3/    7
   CO2 BCKGRD METER/RANGE/PCT               83.8/ 3/ 1.55        43.6/ 2/ 1.93
   NOX SAMPLE METER/RANGE/PPM                3.1/ 3/  .05         1.1/ 2/  .04
   NOX BCKGRD METER/RANGE/PPM               77.4/ 2/   77        40.2/ 3/  121
   HC  CONCENTRATION PPM                      .9/ 2/    1         2.1/ 2/    2
   CO  CONCENTRATION PPM                        1960                 1913
   CO2 CONCENTRATION PCT                         824                 1225
   NOX CONCENTRATION PPM                        1.51                 1.90
   HC  MASS GRAMS                               76.6                118.9
   CO  MASS GRAMS                             177.06               128.51
   CO2 MASS GRAMS                             201.70               166.13
   NOX MASS GRAMS                             5804.8               4044.4
         DFC, WET (DRY)                        30.72                27.90
         SCF, WET (DRY)                     .867 ( .860)         .832 ( .827)
         VOL (SCM)                         1.000 ( .977)        1.000 ( .976)
         KM  (MEASURED)                        210.3                116.4
                                               21.81                16.34
   TEST NUMBER,          PVMT
   BAROMETER,            MM HG                112-32               112-33
   HUMIDITY,             G/KG                  742.9                742.9
   TEMPERATURE,          DEG C                  10.6                 11.7
   TOTAL FUEL SULFUR,    MG/KM                  26.7                 31.1
                                               28.02                26.38
   AVG. EXH. OXYGEN,     PCT
   CATALYST AVG. TEMP.,  DEG C                  6.09                   -
   CATALYST MAX. TEMP.,  DEG C                    -                    -
   CARBON DIOXIDE,       G/KM                     -                    -
   FUEL CONSUMPTION,     L/100KM               266.1                247.5
                                               13.08                12.31
   HYDROCARBONS,         G/KM
   CARBON MONOXIDE,      G/KM                   8.12                 7.86
   OXIDES OF NITROGEN,   G/KM                   9.25                10.17
                                                1.41                 1.68
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TABLE E-7. TEST 113 EMISSIONS RESULTS

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                         PVM - 113   FTP  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                           PROJECT 11-4771-001

TEST NO.   113-11   RUN   1               VEHICLE NO.   11                   TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   77 AMC PACER              DATE    7/25/78                    ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
ENGINE 4.2 L(258 CID) L-6                 BAG CART NO.  1                    GASOLINE  EM-344
TRANSMISSION A3                           DYNO NO.      3                    ODOMETER   6596 KM(  4100 MILES)
GVW  1962 KG(  4326 LBS)                  CVS NO.       2

BAROMETER 743.71 MM HG(29.28 IN HG)       DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)
RELATIVE HUMIDITY 48 PCT                  ABS. HUMIDITY  9.4 GM/KG            NOX HUMIDITY CORRECTION FACTOR   .96
BAG RESULTS
   BAG NUMBER                                     1                  2                   3                   4
   DESCRIPTION                             COLD TRANSIENT       STABILIZED        HOT TRANSIENT        STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)           762.0 (30.0)       762.0 (30.0)       762.0 (30.0)       762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)         762.0 (30.0)       762.0 (30.0)       762.0 (30.0)       762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)        43.3 (110.0)       43.3 (110.0)       43.3 (110.0)       43.3 (110.0)
   BLOWER REVOLUTIONS                          40659              69692              40689              69671
   CVS FLOW STD. CU. METRES(SCF)            76.5 (2700.6)     131.0 (4625.3)      76.5 (2702.5)     131.0 (4627.2)
   HC  SAMPLE METER/RANGE/PPM              14.0/ 3/  140      53.5/ 2/   53      12.0/ 3/  120      44.6/ 3/  446
   HC  BCKGRD METER/RANGE/PPM               1.5/ 3/   15      10.1/ 2/   10       1.0/ 3/   10       1.0/ 3/   10
   CO  SAMPLE METER/RANGE/PPM              62.4/ 3/ 1548      89.5/11/  400      79.6/11/  363      56.4/11/  224
   CO  BCKGRD METER/RANGE/PPM                .2/ 3/    5       2.3/11/    7       4.9/11/   15       4.3/11/   13
   CO2 SAMPLE METER/RANGE/PCT              75.5/ 3/ 1.38      50.0/ 3/  .87      70.5/ 3/ 1.27      44.1/ 3/  .85
   CO2 BCKGRD METER/RANGE/PCT               2.8/ 3/  .04       2.4/ 3/  .04       3.4/ 3/  .05       3.4/ 3/  .05
   NOX SAMPLE METER/RANGE/PPM              54.8/ 2/   55      34.9/ 2/   35      58.8/ 2/   59      36.6/ 2/   37
   NOX BCKGRD METER/RANGE/PPM               1.2/ 2/    1        .9/ 2/    1       1.3/ 2/    1        .8/ 2/    1
   DILUTION FACTOR                              8.68              14.71              10.14              14.55

   HC  CONCENTRATION PPM                         127                 44                111                407
   CO  CONCENTRATION PPM                        1527                381                335                209
   CO2 CONCENTRATION PCT                        1.34                .83               1.23                .80
   NOX CONCENTRATION PPM                        53.7               34.1               57.6               36.4
   HC  MASS GRAMS                               5.59               3.33               4.90               36.77
   CO  MASS GRAMS                             135.97              58.05              29.86               31.17
   CO2 MASS GRAMS                             1874.8             1980.4             1719.4              1922.5
   NOX MASS GRAMS                               7.54               8.19               8.10                8.62

   HC  GRAMS/KM                                  .97                .55                .86                6.05
   CO  GRAMS/KM                                23.68               9.57               5.25                5.13
   CO2 GRAMS/KM                                326.4              326.4              302.6               316.2
   NOX GRAMS/KM                                 1.31               1.35               1.42                1.42
   FUEL CONSUMPTION BY CB L/100KM              15.65              14.65              13.34               14.66

   RUN TIME              SECONDS                 505                866                506                 867
   AVG. EXH. OXYGEN      PERCENT                7.87               6.08               5.67                6.25
   CATALYST AVG. TEMP.   DEG. C                   -                  -                  -                   -
   CATALYST MAX. TEMP.   DEG. C                   -                  -                  -                   -
   MEASURED DISTANCE     KM                     5.74               6.07               5.68                6.08
        DFC, WET (DRY)                               .915 ( .906)                          .920 ( .912)
        SCF, WET (DRY)                              1.000 ( .981)                         1.000 ( .982)
        VOL (SCM)                                          207.4                                 207.5
        KM  (MEASURED)                                     11.81                                 11.76

COMPOSITE RESULTS                                                                                 3-BAG        (4-BAG)
   TEST NUMBER           113-11     TOTAL FUEL SULFUR   MG/KM   31.10     CARBON DIOXIDE       G/KM      319.4       ( 316.4)
   BAROMETER     MM HG   743.7      AVG. EXH. OXYGEN    PCT      6.27     FUEL CONSUMPTION     L/100KM   14.51       ( 14.51)
   HUMIDITY      G/KG      9.4      CATALYST AVG. TEMP. DEG C     -       HYDROCARBONS (THC)   G/KM        .72       (  2.34)
   TEMPERATURE   DEG C    24.4      CATALYST MAX. TEMP. DEG C     -       CARBON MONOXIDE      G/KM      11.33       ( 10.02)
                                                                          OXIDES OF NITROGEN   G/KM       1.36       (  1.38)


                         PVM - 113   SET  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                          PROJECT 11-4771-001

                                          VEHICLE NO.     11                 TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   77 AMC PACER              TRANSMISSION A3                    ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
ENGINE 4.2 L(258 CID) L-6                 GVW  1962 KG(  4326 LBS)           GASOLINE  EM-344

   TEST NUMBER                              113-12                113-13
   TEST CYCLE                                SET                   HFET
   RUN NUMBER                                 1                     1
   DATE                                     7/25/78               7/25/78                         /  /
   ODOMETER                           6629KM(  4119MILES)   6668KM(  4143MILES)
   CVS - BAG CART - DYNAMOMETER            2 - 1 - 3             2 - 1 - 3

   TEMPERATURE DEG. C (DEG. F)            26.7 / 80.0           25.0 / 77.0
   RELATIVE HUMIDITY, PCT                     41.2                  44.0
   BAROMETER, MM HG(IN HG)               742.7 (29.24)         742.7 (29.24)
   RUN TIME, SECONDS                          1397                  766

   BLOWER DIF P MM. H2O(IN. H2O)         762.0 (30.0)          762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)       762.0 (30.0)          762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)      43.3 (110.0)          43.3 (110.0)
   BLOWER REVOLUTIONS                        112175                61530
   CVS FLOW STD. CU. METRES(SCF)         210.6 (7438.5)        115.5 (4080.4)
   HC  SAMPLE METER/RANGE/PPM            78.9/ 2/   79         93.3/ 2/   93
   HC  BCKGRD METER/RANGE/PPM            11.1/ 2/   11         17.6/ 2/   14
   CO  SAMPLE METER/RANGE/PPM            73.4/11/  320         63.0/11/  257
   CO  BCKGRD METER/RANGE/PPM             8.2/11/   26          7.7/11/   24
   CO2 SAMPLE METER/RANGE/PCT            82.4/ 3/ 1.52         41.5/ 2/ 1.82
   CO2 BCKGRD METER/RANGE/PCT             4.3/ 3/  .07          2.0/ 2/  .07
   NOX SAMPLE METER/RANGE/PPM            73.4/ 2/   73         38.8/ 3/  116
   NOX BCKGRD METER/RANGE/PPM              .5/ 2/    1           .7/ 3/    2
   HC  CONCENTRATION PPM                      69                    82
   CO  CONCENTRATION PPM                     284                   223
   CO2 CONCENTRATION PCT                     1.46                  1.76
   NOX CONCENTRATION PPM                     73.0                 114.6
   HC  MASS GRAMS                            8.39                  5.44
   CO  MASS GRAMS                           69.76                 30.06
   CO2 MASS GRAMS                          5635.4                3719.3
   NOX MASS GRAMS                           27.44                 24.67
        DFC, WET (DRY)                   .889 ( .878)          .862 ( .854)
        SCF, WET (DRY)                  1.000 ( .979)         1.000 ( .979)
        VOL (SCM)                           210.6                 115.5
        KM  (MEASURED)                      21.54                 16.23

   TEST NUMBER,           PVMT             113-12                113-13
   BAROMETER,             MM HG             742.7                 742.7
   HUMIDITY,              G/KG                9.2                   9.4
   TEMPERATURE,           DEG C              26.7                  25.0
   TOTAL FUEL SULFUR,     MG/KM             24.95                 21.30

   AVG. EXH. OXYGEN,      PCT                5.33                  4.81
   CATALYST AVG. TEMP.,   DEG C                -                     -
   CATALYST MAX. TEMP.,   DEG C                -                     -
   CARBON DIOXIDE,        G/KM              261.6                 228.4
   FUEL CONSUMPTION,      L/100KM           11.41                  9.94

   HYDROCARBONS,          G/KM                .39                   .34
   CARBON MONOXIDE,       G/KM               3.23                  1.85
   OXIDES OF NITROGEN,    G/KM               1.30                  1.52
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                         TABLE E-8.  TEST 113 EMISSIONS RESULTS
                PVM - 113   FTP  VEHICLE EMISSIONS RESULTS - DISABLED EGR
                                 PROJECT 11-4771-001

TEST NO.   113-21   RUN   1
VEHICLE MODEL    77 AMC PACER               VEHICLE NO.   11
ENGINE 4.2 L(258 CID) L-6                   DATE    7/31/78              TEST WEIGHT   1588 KG(  3500 LBS)
TRANSMISSION A3                             BAG CART NO.  1              ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
GVW  1962 KG(  4326 LBS)                    DYNO NO.      3              GASOLINE  EM-344
                                            CVS NO.       8              ODOMETER   6999 KM(  4349 MILES)

BAROMETER 740.66 MM HG(29.16 IN HG)         DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)
RELATIVE HUMIDITY 66 PCT                    ABS. HUMIDITY 12.1 GM/KG
BAG RESULTS                                                                  NOX HUMIDITY CORRECTION FACTOR  1.05
  BAG NUMBER                                       1                 2                  3                  4
  DESCRIPTION                              COLD TRANSIENT       STABILIZED        HOT TRANSIENT        STABILIZED

  BLOWER DIF P MM. H2O(IN. H2O)            774.7 (30.5)       774.7 (30.5)       774.7 (30.5)       774.7 (30.5)
  BLOWER INLET P MM. H2O(IN. H2O)          774.7 (30.5)       774.7 (30.5)       774.7 (30.5)       774.7 (30.5)
  BLOWER INLET TEMP. DEG. C(DEG. F)         44.4 (112.0)       42.8 (109.0)       43.3 (110.0)       43.3 (110.0)
  BLOWER REVOLUTIONS                           90799              64915              90628              64716
  CVS FLOW STD. CU. METRES(SCF)             76.1 (2687.5)     130.8 (4619.0)      75.9 (2681.3)     130.3 (4600.7)
  HC   SAMPLE METER/RANGE/PPM             17.5/ 3/  175      55.5/ 2/   55      11.0/ 3/  110      44.2/ 2/   44
  HC   BCKGRD METER/RANGE/PPM              1.0/ 3/   10      10.1/ 2/   10        .4/ 3/    4       9.5/ 2/   10
  CO   SAMPLE METER/RANGE/PPM             79.6/ 3/ 1974      40.1/11/  446      77.6/11/  344      62.3/11/  253
  CO   BCKGRD METER/RANGE/PPM               .5/ 3/   11       1.0/11/    5       1.1/11/    3        .4/11/    2
  CO2  SAMPLE METER/RANGE/PCT             73.1/ 3/ 1.33      51.1/ 3/  .89      64.0/ 3/ 1.26      49.9/ 3/  .86
  CO2  BCKGRD METER/RANGE/PCT              3.7/ 3/  .06       3.5/ 3/  .05       3.4/ 3/  .05       3.4/ 3/  .05
  NOX  SAMPLE METER/RANGE/PPM             36.9/ 3/  111      37.3/ 2/   37      40.6/ 3/  122      39.9/ 2/   39
  NOX  BCKGRD METER/RANGE/PPM               .1/ 3/    0       1.1/ 2/    1        .3/ 3/    1       1.7/ 2/    2
  DILUTION FACTOR                               8.79              14.30              10.27              15.14

  HC   CONCENTRATION PPM                        166                 46                102                 40
  CO   CONCENTRATION PPM                       1872                424                338                241
  CO2  CONCENTRATION PCT                       1.28                .84               1.21                .81
  NOX  CONCENTRATION PPM                      110.9               36.3              121.0               37.8
  HC   MASS GRAMS                              7.29               3.48               4.46               3.03
  CO   MASS GRAMS                            165.03              64.55              29.18              36.54
  CO2  MASS GRAMS                            1779.8             2008.1             1686.5             1924.4
  NOX  MASS GRAMS                             16.85               9.51              18.41               9.87

  HC   GRAMS/KM                                1.26                .56                .77                .49
  CO   GRAMS/KM                               28.61              10.47               5.05               5.92
  CO2  GRAMS/KM                               307.0              325.7              292.1              312.1
  NOX  GRAMS/KM                                2.91               1.54               3.19               1.60
  FUEL CONSUMPTION BY CB L/100KM              14.14              14.68              12.91              13.78

  RUN TIME               SECONDS                506                868                505                868
  AVG. EXH. OXYGEN       PERCENT               5.29               5.81               5.40               6.01
  CATALYST AVG. TEMP.    DEG. C                  -                  -                  -                  -
  CATALYST MAX. TEMP.    DEG. C                  -                  -                  -                  -
  MEASURED DISTANCE      KM                    5.80               6.16               5.77               6.17
       DFC, WET (DRY)                                .919 ( .900)                          .922 ( .909)
       SCF, WET (DRY)                               1.000 ( .975)                         1.000 ( .976)
       VOL (SCM)                                         206.4                                 206.2
       KM  (MEASURED)                                    11.96                                 11.94

COMPOSITE RESULTS
  TEST NUMBER             113-21
  BAROMETER     MM HG     740.7     TOTAL FUEL SULFUR   MG/KM   30.65    CARBON DIOXIDE        G/KM       312.6    ( 308.5)
  HUMIDITY      G/KG       12.1     AVG. EXH. OXYGEN    PCT      5.64    FUEL CONSUMPTION      L/100KM    14.30    ( 14.09)
  TEMPERATURE   DEG C      23.3     CATALYST AVG. TEMP. DEG C     -      HYDROCARBONS (THC)    G/KM         .77    (   .74)
                                    CATALYST MAX. TEMP. DEG C     -      CARBON MONOXIDE       G/KM       12.76    ( 11.92)
                                                                         OXIDES OF NITROGEN    G/KM        2.80    (  2.38)


                PVM - 113   SET  VEHICLE EMISSIONS RESULTS - DISABLED EGR
                                 PROJECT 11-4771-001

VEHICLE MODEL    77 AMC PACER               VEHICLE NO.     11
ENGINE 4.2 L(258 CID) L-6                   TRANSMISSION A3                  TEST WEIGHT   1588 KG(  3500 LBS)
                                            GVW  1962 KG(  4326 LBS)         ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
                                                                             GASOLINE  EM-344
  TEST NUMBER
  TEST CYCLE                                   113-22
  RUN NUMBER                                    SET                113-23
  DATE                                           1                  HFET
  ODOMETER                                    7/31/78                 1
  CVS - BAG CART - DYNAMOMETER           7030KM(  4368MILES)       7/31/78
                                              2 - 1 - 3        7068KM(  4392MILES)                 / /
                                                                    2 - 1 - 3
  TEMPERATURE DEG. C (DEG. F)
  RELATIVE HUMIDITY, PCT                     24.4 / 76.0
  BAROMETER, MM HG(IN HG)                       55.5               23.3 / 74.0
  RUN TIME, SECONDS                         740.7 (29.16)             50.1
                                                1397             740.7 (29.16)
                                                                      766
  BLOWER DIF P MM. H2O(IN. H2O)
  BLOWER INLET P MM. H2O(IN. H2O)           774.7 (30.5)
  BLOWER INLET TEMP. DEG. C(DEG. F)         774.7 (30.5)          774.7 (30.5)
  BLOWER REVOLUTIONS                         43.3 (110.0)         774.7 (30.5)
  CVS FLOW STD. CU. METRES(SCF)                112318              43.3 (110.0)
  HC   SAMPLE METER/RANGE/PPM              209.9 (7412.0)            61620
  HC   BCKGRD METER/RANGE/PPM              85.7/ 2/   86         115.1 (4066.7)
  CO   SAMPLE METER/RANGE/PPM              10.0/ 2/   10          9.5/ 3/   95
  CO   BCKGRD METER/RANGE/PPM              71.6/11/  304          1.0/ 3/   10
  CO2  SAMPLE METER/RANGE/PCT                .8/11/    2         56.6/11/  222
  CO2  BCKGRD METER/RANGE/PCT              74.0/ 3/ 1.47          1.5/11/    5
  NOX  SAMPLE METER/RANGE/PPM               4.2/ 3/  .06         42.0/ 2/ 1.84
  NOX  BCKGRD METER/RANGE/PPM              67.1/ 3/  201          1.7/ 2/  .06
  HC   CONCENTRATION PPM                     .7/ 3/    2         28.8/ 4/  288
  CO   CONCENTRATION PPM                         77                .4/ 4/    4
  CO2  CONCENTRATION PCT                        292                    86
  NOX  CONCENTRATION PPM                        1.41                   206
  HC   MASS GRAMS                              199.4                  1.74
  CO   MASS GRAMS                               9.30                 284.6
  CO2  MASS GRAMS                              71.45                  5.74
  NOX  MASS GRAMS                             5412.8                 27.64
       DFC, WET (DRY)                          80.54                3777.6
       SCF, WET (DRY)                       .888 ( .878)              62.50
       VOL (SCM)                           1.000 ( .975)          .868 ( .844)
       KM  (MEASURED)                          209.4             1.000 ( .971)
                                                21.69                 115.1
                                                                      16.53
  TEST NUMBER,            PVMT
  BAROMETER,              MM HG                113-22
  HUMIDITY,               G/KG                 740.7                 113-23
  TEMPERATURE,            DEG C                 10.9                 740.7
  TOTAL FUEL SULFUR,      MG/KM                 24.4                  10.7
                                               23.42                  23.3
  AVG. EXH. OXYGEN,       PCT                                        21.25
  CATALYST AVG. TEMP.,    DEG C                 5.48
  CATALYST MAX. TEMP.,    DEG C                   -                   5.10
  CARBON DIOXIDE,         G/KM                    -                     -
  FUEL CONSUMPTION,       L/100KM              249.5                    -
                                               10.93                 228.6
  HYDROCARBONS,           G/KM                                        9.91
  CARBON MONOXIDE,        G/KM                   .43
  OXIDES OF NITROGEN,     G/KM                  3.29                   .35
                                                3.71                  1.67
                                                                      3.78
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TABLE E-9. TEST 113 EMISSIONS RESULTS

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                                PVH - 113   FTP  VEHICLE EMISSIONS RESULTS - DISABLED EGR
                                                 PROJECT 11-4771-001

TEST NO.   113-31   RUN   1                    VEHICLE NO.   11                        TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   77 AMC PACER                   DATE    8/ 1/78                         ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
ENGINE 4.2 L(258 CID) L-6                      BAG CART NO.  1                         GASOLINE  EM-344
TRANSMISSION A3                                DYNO NO.      3                         ODOMETER   7084 KM(  4402 MILES)
GVW  1962 KG(  4326 LBS)                       CVS NO.       2

BAROMETER 741.17 MM HG(29.18 IN HG)            DRY BULB TEMP. 22.8 DEG C(73.0 DEG F)
RELATIVE HUMIDITY 61 PCT                       ABS. HUMIDITY 10.9 GM/KG                NOX HUMIDITY CORRECTION FACTOR  1.01
BAG RESULTS
   BAG NUMBER                                          1                  2                  3                   4
   DESCRIPTION                                   COLD TRANSIENT      STABILIZED       HOT TRANSIENT       STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)                 774.7 (30.5)       774.7 (30.5)      774.7 (30.5)       774.7 (30.5)
   BLOWER INLET P MM. H2O(IN. H2O)               774.7 (30.5)       774.7 (30.5)      774.7 (30.5)       774.7 (30.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)              43.3 (110.0)       43.3 (110.0)      43.3 (110.0)       43.3 (110.0)
   BLOWER REVOLUTIONS                                40733              69715             40860              69564
   CVS FLOW STD. CU. METRES(SCF)                  76.2 (2690.6)     130.4 (4604.2)     76.4 (2699.2)     130.1 (4594.4)
   HC  SAMPLE METER/RANGE/PPM                    17.6/ 3/  176      62.0/ 2/   62     13.3/ 3/  133      59.3/ 2/   59
   HC  BCKGRD METER/RANGE/PPM                     1.5/ 3/   15      17.1/ 2/   17      1.3/ 3/   13      19.5/ 2/   19
   CO  SAMPLE METER/RANGE/PPM                    79.1/ 3/ 1957      89.7/11/  443     81.9/11/  380      66.0/11/  279
   CO  BCKGRD METER/RANGE/PPM                     1.3/ 3/   29       8.2/11/   26      5.1/11/   16       9.9/11/   19
   CO2 SAMPLE METER/RANGE/PCT                    73.3/ 3/ 1.33      51.9/ 3/  .89     69.8/ 3/ 1.26      51.9/ 3/  .89
   CO2 BCKGRD METER/RANGE/PCT                     3.2/ 3/  .05       3.9/ 3/  .06      4.3/ 3/  .07       4.8/ 3/  .07
   NOX SAMPLE METER/RANGE/PPM                    38.2/ 3/  115      38.7/ 2/   39     42.3/ 3/  127      41.0/ 2/   41
   NOX BCKGRD METER/RANGE/PPM                      .8/ 3/    2       3.1/ 2/    3       .7/ 3/    2       2.4/ 2/    2
   DILUTION FACTOR                                    8.72              14.21             10.23              14.47

   HC  CONCENTRATION PPM                              163                 46                121                 41
   CO  CONCENTRATION PPM                             1892                403                349                252
   CO2 CONCENTRATION PCT                             1.29                .84               1.20                .83
   NOX CONCENTRATION PPM                            112.5               35.8              125.0               38.8
   HC  MASS GRAMS                                    7.15               3.47               5.35               3.06
   CO  MASS GRAMS                                  163.44              61.15              31.10              38.13
   CO2 MASS GRAMS                                  1797.2             2001.4             1680.2             1966.3
   NOX MASS GRAMS                                   16.49               8.99              18.39               9.71

   HC  GRAMS/KM                                      1.25                .56                .92                .50
   CO  GRAMS/KM                                     28.52               9.90               5.36               6.21
   CO2 GRAMS/KM                                     313.6              324.3              289.4              320.4
   NOX GRAMS/KM                                      2.88               1.46               3.17               1.58
   FUEL CONSUMPTION BY CB L/100KM                   15.47              14.58              12.84              14.16

   RUN TIME              SECONDS                      505                867                506                866
   AVG. EXH. OXYGEN      PERCENT                     5.32               5.47               5.56               6.12
   CATALYST AVG. TEMP.   DEG. C                        -                  -                  -                  -
   CATALYST MAX. TEMP.   DEG. C                        -                  -                  -                  -
   MEASURED DISTANCE     KM                          5.73               6.17               5.81               6.14
        DFC, WET (DRY)                                       .913 ( .901)                         .920 ( .908)
        SCF, WET (DRY)                                      1.000 ( .977)                        1.000 ( .977)
        VOL (SCM)                                                  206.5                                206.5
        KM  (MEASURED)                                             11.90                                11.95

COMPOSITE RESULTS                                                                                          3-BAG        (4-BAG)
  TEST NUMBER              113-31    TOTAL FUEL SULFUR   MG/KM   30.61    CARBON DIOXIDE       G/KM      312.9       ( 311.3)
  BAROMETER     MM HG      741.2     AVG. EXH. OXYGEN    PCT      5.78    FUEL CONSUMPTION     L/100KM   14.28       ( 14.16)
  HUMIDITY      G/KG        10.9     CATALYST AVG. TEMP. DEG C     -      HYDROCARBONS (THC)   G/KM        .80       (   .78)
  TEMPERATURE   DEG C       22.8     CATALYST MAX. TEMP. DEG C     -      CARBON MONOXIDE      G/KM      12.50       ( 11.92)
                                                                          OXIDES OF NITROGEN   G/KM       2.22       (  2.26)
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                                PVH - 113   SET  VEHICLE EMISSIONS RESULTS - DISABLED EGR
                                                 PROJECT 11-4771-001

VEHICLE MODEL   77 AMC PACER                   VEHICLE NO.    11                       TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 4.2 L(258 CID) L-6                      TRANSMISSION A3                         ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
                                               GVW  1962 KG(  4326 LBS)                GASOLINE  EM-344

   TEST NUMBER                                  113-32                  113-33
   TEST CYCLE                                    SET                     HFET
   RUN NUMBER                                     1                        1
   DATE                                         8/ 1/78                  8/ 1/78                            /  /
   ODOMETER                                  7117KM(  4422MILES)      7159KM(  4448MILES)
   CVS - BAG CART - DYNAMOMETER                2 - 1 - 3                2 - 1 - 3

   TEMPERATURE DEG. C (DEG. F)                 25.6 / 78.0              25.6 / 78.0
   RELATIVE HUMIDITY, PCT                         39.9                     39.9
   BAROMETER, MM HG(IN HG)                    741.4 (29.19)            741.4 (29.19)
   RUN TIME, SECONDS                              1398                      765

   BLOWER DIF P MM. H2O(IN. H2O)              774.7 (30.5)             774.7 (30.5)
   BLOWER INLET P MM. H2O(IN. H2O)            774.7 (30.5)             774.7 (30.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)           43.3 (110.0)             43.3 (110.0)
   BLOWER REVOLUTIONS                             112270                    61555
   CVS FLOW STD. CU. METRES(SCF)              210.0 (7417.3)           115.1 (4067.0)
   HC  SAMPLE METER/RANGE/PPM                 81.5/ 2/   81             9.5/ 3/   95
   HC  BCKGRD METER/RANGE/PPM                 12.8/ 2/   13             1.3/ 3/   13
   CO  SAMPLE METER/RANGE/PPM                 63.3/11/  299            53.1/11/  209
   CO  BCKGRD METER/RANGE/PPM                  2.8/11/    9             2.3/11/    7
   CO2 SAMPLE METER/RANGE/PCT                 79.6/ 3/ 1.46            40.5/ 2/ 1.77
   CO2 BCKGRD METER/RANGE/PCT                  4.9/ 3/  .08             2.0/ 2/  .07
   NOX SAMPLE METER/RANGE/PPM                 62.0/ 3/  108            31.5/ 4/  315
   NOX BCKGRD METER/RANGE/PPM                   .6/ 3/    2              .7/ 4/    7
   HC  CONCENTRATION PPM                            70                       84
   CO  CONCENTRATION PPM                           290                      189
   CO2 CONCENTRATION PCT                          1.39                     1.70
   NOX CONCENTRATION PPM                         106.8                    308.9
   HC  MASS GRAMS                                 8.49                     5.56
   CO  MASS GRAMS                                58.80                    25.28
   CO2 MASS GRAMS                               5362.7                   3591.0
   NOX MASS GRAMS                                69.57                    63.09
        DFC, WET (DRY)                        .888 ( .883)             .866 ( .861)
        SCF, WET (DRY)                       1.000 ( .980)            1.000 ( .977)
        VOL (SCM)                                210.0                    115.1
        KM  (MEASURED)                           21.62                    16.35

   TEST NUMBER,          PVHT                   113-32                   113-33
   BAROMETER,            MM HG                   741.4                    741.4
   HUMIDITY,             G/KG                      8.3                      8.3
   TEMPERATURE,          DEG C                    25.6                     25.6
   TOTAL FUEL SULFUR,    MG/KM                   23.19                    20.41

   AVG. EXH. OXYGEN,     PCT                      5.69                     5.17
   CATALYST AVG. TEMP.,  DEG C                      -                        -
   CATALYST MAX. TEMP.,  DEG C                      -                        -
   CARBON DIOXIDE,       G/KM                    248.0                    219.6
   FUEL CONSUMPTION,     L/100KM                 10.82                     9.52

   HYDROCARBONS,         G/KM                      .39                      .34
   CARBON MONOXIDE,      G/KM                     2.72                     1.55
   OXIDES OF NITROGEN,   G/KM                     3.22                     3.86
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TABLE E-10. TEST 119 EMISSIONS RESULTS

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                         PVM - 119   FTP  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                          PROJECT 11-4771-001

TEST NO.   119-11   RUN   1
VEHICLE MODEL   77 AMC PACER                VEHICLE NO.   11
ENGINE 4.2 L(258 CID) L-6                   DATE    8/31/78                     TEST WEIGHT   1588 KG(  3500 LBS)
TRANSMISSION A3                             BAG CART NO.  1                     ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
GVW  1962 KG(  4326 LBS)                    DYNO NO.      3                     GASOLINE  EM-344
                                            CVS NO.       2                     ODOMETER   8792 KM(  5463 MILES)

BAROMETER 742.44 MM HG(29.23 IN HG)         DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)
RELATIVE HUMIDITY 57 PCT                    ABS. HUMIDITY  9.7 GM/KG
BAG RESULTS                                                                     NOX HUMIDITY CORRECTION FACTOR   .97
  BAG NUMBER                                      1                   2                   3                    4
  DESCRIPTION                               COLD TRANSIENT       STABILIZED        HOT TRANSIENT          STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)             749.3 (29.5)        749.3 (29.5)       749.3 (29.5)         749.3 (29.5)
   BLOWER INLET P MM. H2O(IN. H2O)           749.3 (29.5)        749.3 (29.5)       749.3 (29.5)         749.3 (29.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)          43.3 (110.0)        43.3 (110.0)       43.3 (110.0)         43.3 (110.0)
   BLOWER REVOLUTIONS                           91005               69796              45773                69676
   CVS FLOW STD. CU. METRES(SCF)              77.1 (2724.1)      131.1 (4630.2)      76.7 (2708.3)       131.0 (4627.3)
   HC  SAMPLE METER/RANGE/PPM               16.7/ 3/  167       67.1/ 2/   67      11.7/ 3/  117        64.0/ 2/   64
   HC  BCKGRD METER/RANGE/PPM                1.3/ 3/   13       12.3/ 2/   12       1.3/ 3/   13        11.9/ 2/   11
   CO  SAMPLE METER/RANGE/PPM               71.1/ 3/ 1457       44.5/11/  405      26.0/ 3/  603        86.2/11/  314
   CO  BCKGRD METER/RANGE/PPM                 .9/ 3/   20        5.1/11/   16        .3/ 3/    7         3.9/11/   10
   CO2 SAMPLE METER/RANGE/PCT               76.4/ 3/ 1.41       52.0/ 3/  .91      78.1/ 3/ 1.31        50.6/ 3/  .88
   CO2 BCKGRD METER/RANGE/PCT                4.5/ 3/  .07        4.1/ 3/  .06       4.7/ 3/  .07         3.9/ 3/  .06
   NOX SAMPLE METER/RANGE/PPM               51.8/ 2/   52       31.6/ 2/   32      53.4/ 2/   54        33.8/ 2/   34
   NOX BCKGRD METER/RANGE/PPM                 .7/ 2/    1         .8/ 2/    1       1.0/ 2/    1          .8/ 2/    1
   DILUTION FACTOR                               8.38               13.47               9.74                14.44

   HC  CONCENTRATION PPM                         156                  56                 106                   53
   CO  CONCENTRATION PPM                        1755                 454                 571                  304
   CO2 CONCENTRATION PCT                        1.34                 .85                1.24                  .82
   NOX CONCENTRATION PPM                        51.2                30.9                52.0                 33.1
   HC  MASS GRAMS                               6.92                4.21                4.66                 4.03
   CO  MASS GRAMS                             157.66               64.20               51.00                64.90
   CO2 MASS GRAMS                             1844.3              2035.2              1744.3               1474.6
   NOX MASS GRAMS                               7.32                7.50                7.53                 8.03

   HC  GRAMS/KM                                 1.21                 .69                 .81                  .66
   CO  GRAMS/KM                                27.62               11.31                8.88                 4.71
   CO2 GRAMS/KM                                332.7               332.4               303.8                288.6
   NOX GRAMS/KM                                 1.28                1.23                1.31                 1.31
   FUEL CONSUMPTION BY CB L/100KM              16.22               15.04               13.67                14.51

   RUN TIME                   SECONDS            506                 867                 505                  867
   AVG. EXH. OXYGEN           PERCENT           5.13                6.04                5.40                 6.22
   CATALYST AVG. TEMP.        DEG. C              -                   -                   -                    -
   CATALYST MAX. TEMP.        DEG. C              -                   -                   -                    -
   MEASURED DISTANCE          KM                5.71                6.12                5.74                 6.12
        DFC, WET (DRY)                                  .911 ( .900)                              .919 ( .908)
        SCF, WET (DRY)                                 1.000 ( .978)                             1.000 ( .978)
        VOL (SCM)                                            208.3                                     207.7
        KM  (MEASURED)                                       11.83                                     11.86

COMPOSITE RESULTS
   TEST NUMBER               119-11
   BAROMETER      MM HG      742.4    TOTAL FUEL SULFUR    MG/KM   31.44      CARBON DIOXIDE       G/KM     3-BAG      (4-BAG)
   HUMIDITY       G/KG         9.7    AVG. EXH. OXYGEN     PCT      5.76      FUEL CONSUMPTION     L/100KM  324.6      ( 321.7)
   TEMPERATURE    DEG C       22.2    CATALYST AVG. TEMP. DEG C      -        HYDROCARBONS (THC)   G/KM     14.41      ( 14.75)
                                      CATALYST MAX. TEMP. DEG C      -        CARBON MONOXIDE      G/KM       .83      (   .88)
                                                                              OXIDES OF NITROGEN   G/KM     14.03      ( 13.55)
                                                                                                              1.26      (  1.29)
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                         PVM - 119   SBT  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                          PROJECT 11-4771-001

VEHICLE MODEL   77 AMC PACER                VEHICLE NO.    11                  TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 4.2 L(258 CID) L-6                   TRANSMISSION A3                     ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
                                            GVW  1962 KG(  4326 LBS)            GASOLINE  EM-344

   TEST NUMBER                                  119-12                  119-13
   TEST CYCLE                                   SET                     HFET
   RUN NUMBER                                    1                       1
   DATE                                        8/31/78                 8/31/78                       / /
   ODOMETER                                 8822KM(  5482MILES)     8859KM(  5505MILES)
   CVS - BAG CART - DYNAMOMETER               2 - 1 - 3               2 - 1 - 3

   TEMPERATURE DEG. C (DEG. F)               24.4 / 76.0             23.9 / 75.0
   RELATIVE HUMIDITY, PCT                       48.4                    54.4
   BAROMETER, MM HG(IN HG)                  742.7 (29.24)           742.7 (29.24)
   RUN TIME, SECONDS                            1397                     765

   BLOWER DIF P MM. H2O(IN. H2O)             749.3 (29.5)            749.3 (29.5)
   BLOWER INLET P MM. H2O(IN. H2O)           749.3 (29.5)            749.3 (29.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)          43.3 (110.0)            43.3 (110.0)
   BLOWER REVOLUTIONS                          112506                   61877
   CVS FLOW STD. CU. METRES(SCF)             211.6 (7475.2)          116.4 (4112.0)
   HC  SAMPLE METER/RANGE/PPM                40.4/ 2/   40           89.6/ 2/   90
   HC  BCKGRD METER/RANGE/PPM                11.0/ 2/   11           10.0/ 2/   10
   CO  SAMPLE METER/RANGE/PPM                45.5/11/  445           67.0/11/  280
   CO  BCKGRD METER/RANGE/PPM                 4.7/11/   14            2.4/11/    4
   CO2 SAMPLE METER/RANGE/PCT                82.4/ 3/ 1.53           44.1/ 2/ 1.46
   CO2 BCKGRD METER/RANGE/PCT                 3.6/ 3/  .06            1.7/ 2/  .06
   NOX SAMPLE METER/RANGE/PPM                70.3/ 2/   70           33.7/ 3/  101
   NOX BCKGRD METER/RANGE/PPM                 1.0/ 2/    1             .5/ 3/    2
   HC  CONCENTRATION PPM                         31                      81
   CO  CONCENTRATION PPM                        460                     257
   CO2 CONCENTRATION PCT                        1.48                    1.90
   NOX CONCENTRATION PPM                        69.4                    44.8
   HC  MASS GRAMS                               4.05                    5.44
   CO  MASS GRAMS                             113.35                   34.88
   CO2 MASS GRAMS                             5741.2                  4454.6
   NOX MASS GRAMS                              26.44                   22.00
        DFC, WET (DRY)                       .882 ( .874)            .851 ( .842)
        SCF, WET (DRY)                      1.000 ( .977)           1.000 ( .971)
        VOL (SCM)                              211.6                   116.4
        KM  (MEASURED)                         21.44                   16.17

   TEST NUMBER,          PVMT                  119-12                  119-13
   BAROMETER,            MM HG                 742.7                   742.7
   HUMIDITY,             G/KG                    9.5                    10.4
   TEMPERATURE,          DEG C                  24.4                    23.9
   TOTAL FUEL SULFUR,    MG/KM                 25.33                   23.38

   AVG. EXH. OXYGEN,     PCT                    5.30                    4.85
   CATALYST AVG. TEMP.,  DEG C                    -                       -
   CATALYST MAX. TEMP.,  DEG C                    -                       -
   CARBON DIOXIDE,       G/KM                  267.2                   251.1
   FUEL CONSUMPTION,     L/100KM               11.82                   10.91

   HYDROCARBONS,         G/KM                    .96                     .39
   CARBON MONOXIDE,      G/KM                   5.28                    2.16
   OXIDES OF NITROGEN,   G/KM                   1.26                    1.36
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TABLE E-11. TEST 114 EMISSIONS RESULTS

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                      PVM - 114   FTP  VEHICLE EMISSIONS RESULTS - HIGH OIL CONSUMPTION
                                       PROJECT 11-4771-001

TEST NO.   114-21   RUN  1                VEHICLE NO.  11                     TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   77 AMC PACER              DATE    9/ 6/78                     ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
ENGINE 4.2 L(258 CID) L-6                 BAG CART NO.  1                     GASOLINE  EM-349
TRANSMISSION A3                           DYNO NO.      3                     ODOMETER   9252 KM(  5710 MILES)
GVW  1962 KG(  4326 LBS)                  CVS NO.       2

BAROMETER 740.16 MM HG(29.14 IN HG)       DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)
RELATIVE HUMIDITY 62 PCT                  ABS. HUMIDITY 11.4 GM/KG             NOX HUMIDITY CORRECTION FACTOR  1.02
BAG RESULTS
  BAG NUMBER                                     1                 2                  3                  4
  DESCRIPTION                              COLD TRANSIENT      STABILIZED        HOT TRANSIENT       STABILIZED

  BLOWER DIF P MM. H2O(IN. H2O)            774.7 (30.5)       762.0 (30.0)      762.0 (30.0)       762.0 (30.0)
  BLOWER INLET P MM. H2O(IN. H2O)          774.7 (30.5)       762.0 (30.0)      762.0 (30.0)       762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)         43.3 (110.0)       43.3 (110.0)      43.3 (110.0)       43.3 (110.0)
  BLOWER REVOLUTIONS                          40763              69807             40663              69671
  CVS FLOW STD. CU. METRES(SCF)             76.1 (2688.6)     130.6 (4612.0)     76.1 (2686.5)     130.3 (4602.9)
  HC  SAMPLE METER/RANGE/PPM               29.6/ 3/ 296       47.2/ 2/  47      13.3/ 3/ 133       86.3/ 2/  86
  HC  BCKGRD METER/RANGE/PPM                1.8/ 3/  18       15.4/ 2/  15       1.9/ 3/  19       13.5/ 2/  13
  CO  SAMPLE METER/RANGE/PPM               86.2/ 2/ 2791      44.6/ 3/ 1076     38.4/ 3/ 413       33.0/ 3/ 776
  CO  BCKGRD METER/RANGE/PPM                 .4/ 2/  15         .8/ 3/  18        .3/ 3/   7         .4/ 3/   9
  CO2 SAMPLE METER/RANGE/PCT               79.6/ 3/ 1.36      50.4/ 3/ .87      70.6/ 3/ 1.20      49.4/ 3/ .87
  CO2 BCKGRD METER/RANGE/PCT                4.5/ 3/ .07        4.6/ 3/ .07       4.4/ 3/ .07        3.4/ 3/ .06
  NOX SAMPLE METER/RANGE/PPM               42.6/ 2/  43       31.1/ 2/  31      56.4/ 2/  57       34.8/ 2/  35
  NOX BCKGRD METER/RANGE/PPM                1.0/ 2/   1        1.2/ 2/   1       1.1/ 2/   1        1.2/ 2/   1
  DILUTION FACTOR                             9.13              15.56              9.73              15.13

  HC  CONCENTRATION PPM                        270                83                120                 74
  CO  CONCENTRATION PPM                       2669              1029                866                739
  CO2 CONCENTRATION PCT                       1.30               .81               1.22                .81
  NOX CONCENTRATION PPM                       41.7              30.0               55.4               33.7
  HC  MASS GRAMS                             10.11              6.25               5.28               5.59
  CO  MASS GRAMS                            239.05            155.07              76.73             112.17
  CO2 MASS GRAMS                            1808.4            1939.9             1693.5             1932.2
  NOX MASS GRAMS                              6.21              7.66               8.32               8.54

  HC  GRAMS/KM                                1.75              1.02                .92                .90
  CO  GRAMS/KM                               40.75             25.34              13.30              18.16
  CO2 GRAMS/KM                               313.4             316.8              293.4              312.8
  NOX GRAMS/KM                                1.08              1.25               1.44               1.38
  FUEL CONSUMPTION BY CB L/100KM             16.37             15.33              13.54              14.64

  RUN TIME               SECONDS               505               868                505                867
  AVG. EXH. OXYGEN       PERCENT              5.04              5.80               5.23               5.47
  CATALYST AVG. TEMP.    DEG. C                 -                 -                  -                  -
  CATALYST MAX. TEMP.    DEG. C                 -                 -                  -                  -
  MEASURED DISTANCE      KM                   5.76              6.12               5.77               6.18
       DFC. WET (DRY)                                 .908 ( .896)                          .917 ( .905)
       SCF. WET (DRY)                                1.000 ( .977)                         1.000 ( .977)
       VOL (SCM)                                           206.7                                 206.4
       KM  (MEASURED)                                      11.88                                 11.95

COMPOSITE RESULTS                                                                                  3-BAG        (4-BAG)
  TEST NUMBER           114-21     TOTAL FUEL SULFUR   MG/KM   32.26      CARBON DIOXIDE      G/KM     309.4      ( 308.5)
  BAROMETER     MM HG   740.2      AVG. EXH. OXYGEN    PCT      5.57      FUEL CONSUMPTION    L/100KM  15.05      ( 14.87)
  HUMIDITY      G/KG     11.4      CATALYST AVG. TEMP. DEG C     -        HYDROCARBONS (THC)  G/KM      1.14      (  1.11)
  TEMPERATURE   DEG C    23.3      CATALYST MAX. TEMP. DEG C     -        CARBON MONOXIDE     G/KM     24.22      ( 23.12)
                                                                          OXIDES OF NITROGEN  G/KM      1.27      (  1.31)


                      PVM - 114   SET  VEHICLE EMISSIONS RESULTS - HIGH OIL CONSUMPTION
                                       PROJECT 11-4771-001

                                          VEHICLE NO.     11                  TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   77 AMC PACER              TRANSMISSION A3                     ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
ENGINE 4.2 L(258 CID) L-6                 GVW  1962 KG(  4326 LBS)            GASOLINE  EM-349

  TEST NUMBER                                114-22                  114-23
  TEST CYCLE                                  SET                     HFET
  RUN NUMBER                                   1                       1
  DATE                                       9/ 6/78                 9/ 6/78                          / /
  ODOMETER                                  0KM(     -0MILES)       9271KM(  5761MILES)
  CVS - BAG CART - DYNAMOMETER              2 - 1 - 3               2 - 1 - 3

  TEMPERATURE HEB. C (DEG. F)               24.4 / 76.0             26.1 / 79.0
  RELATIVE HUMIDITY, PCT                      48.5                    40.6
  BAROMETER, MM HG(IN HG)                   740.2 (29.14)           740.2 (29.14)
  RUN TIME, SECONDS                           1397                     765

  BLOWER DIF P MM. H2O(IN. H2O)             762.0 (30.0)            787.4 (31.0)
  BLOWER INLET P MM. H2O(IN. H2O)           762.0 (30.0)            787.4 (31.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)          43.3 (110.0)            43.3 (110.0)
  BLOWER REVOLUTIONS                          112417                  61758
  CVS FLOW STD. CU. METRES(SCF)             210.3 (7427.2)          115.1 (4066.0)
  HC  SAMPLE METER/RANGE/PPM                10.8/ 3/  108           82.0/ 2/   82
  HC  BCKGRD METER/RANGE/PPM                 1.9/ 3/   19           13.8/ 2/   14
  CO  SAMPLE METER/RANGE/PPM                37.6/ 3/  898           80.7/11/  371
  CO  BCKGRD METER/RANGE/PPM                  .5/ 3/   11            1.0/11/    5
  CO2 SAMPLE METER/RANGE/PCT                82.5/ 3/ 1.52           90.1/ 2/ 1.74
  CO2 BCKGRD METER/RANGE/PCT                 4.3/ 3/  .07            2.0/ 2/  .07
  NOX SAMPLE METER/RANGE/PPM                74.1/ 2/   74           45.4/ 2/   46
  NOX BCKGRD METER/RANGE/PPM                 1.8/ 2/    2            2.0/ 2/    2
  HC  CONCENTRATION PPM                         46                      70
  CO  CONCENTRATION PPM                        863                     364
  CO2 CONCENTRATION PCT                       1.46                    1.68
  NOX CONCENTRATION PPM                       72.8                    45.2
  HC  MASS GRAMS                             11.61                    4.65
  CO  MASS GRAMS                            206.31                   46.80
  CO2 MASS GRAMS                            5636.0                  3546.0
  NOX MASS GRAMS                             28.15                   19.90
       DFC. WET (DRY)                     .874 ( .871)            .867 ( .861)
       SCF. WET (DRY)                    1.000 ( .977)           1.000 ( .977)
       VOL (SCM)                             210.3                   115.1
       KM  (MEASURED)                        21.60                   16.49

  TEST NUMBER,           PVMT                114-22                  114-23
  BAROMETER,             MM HG               740.2                   740.2
  HUMIDITY,              G/KG                  9.3                     8.8
  TEMPERATURE,           DEG C                24.4                    26.1
  TOTAL FUEL SULFUR,     MG/KM               25.34                   20.22

  AVG. EXH. OXYGEN,      PCT                  5.14                    4.56
  CATALYST AVG. TEMP.,   DEG C                  -                       -
  CATALYST MAX. TEMP.,   DEG C                  -                       -
  CARBON DIOXIDE,        G/KM                260.9                   215.7
  FUEL CONSUMPTION,      L/100KM             11.85                    9.43

  HYDROCARBONS,          G/KM                  .54                     .28
  CARBON MONOXIDE,       G/KM                 9.55                    2.85
  OXIDES OF NITROGEN,    G/KM                 1.30                    1.19
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TABLE E-12. TEST 114 EMISSIONS RESULTS

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                          PVM - 114   FTP   VEHICLE EMISSIONS RESULTS - HIGH OIL CONSUMPTION
                                            PROJECT 11-4771-001

TEST NO.   114-31   RUN   1
VEHICLE MODEL    77 AMC PACER                VEHICLE NO.   11                   TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 4.2 L(258 CID) L-6                    DATE    9/ 7/78                    ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
TRANSMISSION A3                              BAG CART NO.  1                    GASOLINE  EM-344
GVW  1962 KG(  4326 LBS)                     DYNO NO.      3                    ODOMETER   9289 KM(  5772 MILES)
                                             CVS NO.       2

BAROMETER 739.14 MM HG(29.10 IN HG)          DRY BULB TEMP. 21.7 DEG C(71.0 DEG F)
RELATIVE HUMIDITY 64 PCT                     ABS. HUMIDITY 10.7 GM/KG
BAG RESULTS                                                                     NOX HUMIDITY CORRECTION FACTOR  1.00
  BAG NUMBER
  DESCRIPTION                                    1                  2                   3                   4
                                           COLD TRANSIENT      STABILIZED         HOT TRANSIENT        STABILIZED
   BLOWER DIF P MM. H2O(IN. H2O)
   BLOWER INLET P MM. H2O(IN. H2O)          736.6 (29.0)       762.0 (30.0)        744.3 (29.3)       774.7 (30.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)        744.3 (29.3)       774.7 (30.5)        762.0 (30.0)       774.7 (30.5)
   BLOWER REVOLUTIONS                        43.3 (110.0)       43.9 (111.0)        43.9 (111.0)       43.9 (111.0)
   CVS FLOW STD. CU. METRES(SCF)               40953              69763               40778              69721
   HC  SAMPLE METER/RANGE/PPM               76.3 (2695.0)      130.0 (4591.4)      76.1 (2688.0)      129.9 (4586.4)
   HC  BCKGRD METER/RANGE/PPM              29.6/ 3/  296       89.3/ 2/   89       12.0/ 3/  120       86.1/ 2/   86
   CO  SAMPLE METER/RANGE/PPM               1.5/ 3/   15       16.0/ 2/   16        1.4/ 3/   14       13.0/ 2/   13
   CO  BCKGRD METER/RANGE/PPM              59.9/ 2/ 3043       37.0/ 3/  848       41.7/ 3/  444       35.4/ 3/  844
   CO2 SAMPLE METER/RANGE/PCT                .6/ 2/   23         .6/ 3/   19         .4/ 3/    4         .3/ 3/    7
   CO2 BCKGRD METER/RANGE/PCT              73.0/ 3/ 1.33       80.1/ 3/  .83       70.4/ 3/ 1.28       44.8/ 3/  .86
   NOX SAMPLE METER/RANGE/PPM               3.4/ 3/  .06        4.0/ 3/  .06        4.0/ 3/  .06        4.1/ 3/  .06
   NOX BCKGRD METER/RANGE/PPM              38.5/ 2/   38       31.0/ 2/   31       52.3/ 2/   52       33.7/ 2/   33
   DILUTION FACTOR                           .8/ 2/    1         .6/ 2/    1         .2/ 2/    0         .1/ 2/    0
                                                8.17               13.90                9.64               14.14
   HC  CONCENTRATION PPM
   CO  CONCENTRATION PPM                        213                  76                 115                  76
   CO2 CONCENTRATION PCT                       2882                 862                 446                 811
   NOX CONCENTRATION PPM                       1.27                 .81                1.22                 .80
   HC  MASS GRAMS                              37.0                30.4                52.1                32.6
   CO  MASS GRAMS                             10.25                5.50                5.07                5.54
   CO2 MASS GRAMS                            256.00              120.90               83.02              122.65
   NOX MASS GRAMS                            1776.7              1493.3              1707.4              1400.1
                                               5.52                7.57                7.54                8.10
   HC  GRAMS/KM
   CO  GRAMS/KM                                1.74                 .91                 .88                 .90
   CO2 GRAMS/KM                               44.69               21.06               10.84               14.95
   NOX GRAMS/KM                               310.4               318.4               296.2               309.0
   FUEL CONSUMPTION BY CB L/100KM               .96                1.87                1.38                1.32
                                              16.94               18.02               12.74               14.65
   RUN TIME              SECONDS
   AVG. EXH. OXYGEN      PERCENT                505                 867                 505                 867
   CATALYST AVG. TEMP.   DEG. C                5.22                6.03                5.07                5.88
   CATALYST MAX. TEMP.   DEG. C                  -                   -                   -                   -
   MEASURED DISTANCE     KM                      -                   -                   -                   -
       DFC. WET (DRY)                          5.73                6.18                5.76                6.19
       SCF. WET (DRY)                                 .909 ( .896)                              .917 ( .904)
       VOL (SCM)                                     1.000 ( .976)                             1.000 ( .976)
       KM  (MEASURED)                                        206.3                                     206.0
                                                             11.85                                     11.91
COMPOSITE RESULTS
  TEST NUMBER                114-31
  BAROMETER     MM HG        739.1      TOTAL FUEL SULFUR   MG/KM    32.08       CARBON DIOXIDE       G/KM      3-BAG      (4-BAG)
  HUMIDITY      G/KG          10.7      AVG. EXH. OXYGEN    PCT       5.78       FUEL CONSUMPTION     L/100KM   309.3     ( 307.3)
  TEMPERATURE   DEG C         21.7      CATALYST AVG. TEMP. DEG C      -         HYDROCARBONS (THC)   G/KM      14.47     ( 14.86)
                                        CATALYST MAX. TEMP. DEG C      -         CARBON MONOXIDE      G/KM       1.09     (  1.08)
                                                                                 OXIDES OF NITROGEN   G/KM      24.17     ( 23.85)
                                                                                                                 1.20     (  1.23)


                          PVM - 114   SET   VEHICLE EMISSIONS RESULTS - HIGH OIL CONSUMPTION
                                            PROJECT 11-4771-001

VEHICLE MODEL    77 AMC PACER                VEHICLE NO.    11                  TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 4.2 L(258 CID) L-6                    TRANSMISSION A3                    ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
                                             GVW  1962 KG(  4326 LBS)           GASOLINE  EM-344
   TEST NUMBER
   TEST CYCLE                                  114-32                  114-33
   RUN NUMBER                                   SET                     HFET
   DATE                                          1                       2
   ODOMETER                                   9/ 7/78                 9/ 7/78
   CVS - BAG CART - DYNAMOMETER          9313KM(  5787MILES)     9389KM(  5834MILES)             / /
                                              2 - 1 - 3               2 - 1 - 3
   TEMPERATURE DEG. C (DEG. F)
   RELATIVE HUMIDITY, PCT                    25.0 / 77.0             23.3 / 74.0
   BAROMETER, MM HG(IN HG)                       44.1                    50.4
   RUN TIME, SECONDS                        739.6 (29.12)           739.6 (29.12)
                                                 1396                    767
   BLOWER DIF P MM. H2O(IN. H2O)
   BLOWER INLET P MM. H2O(IN. H2O)          787.4 (31.0)            787.4 (31.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)        787.4 (31.0)            800.1 (31.5)
   BLOWER REVOLUTIONS                        43.9 (111.0)            43.9 (111.0)
   CVS FLOW STD. CU. METRES(SCF)               118458                  61858
   HC  SAMPLE METER/RANGE/PPM              209.2 (7390.3)          114.9 (4059.7)
   HC  BCKGRD METER/RANGE/PPM              10.0/ 3/  100           48.2/ 2/   48
   CO  SAMPLE METER/RANGE/PPM                .4/ 3/    4           11.7/ 2/   12
   CO  BCKGRD METER/RANGE/PPM              38.4/ 3/  426           85.4/11/  407
   CO2 SAMPLE METER/RANGE/PCT                .5/ 3/   11            1.4/11/    6
   CO2 BCKGRD METER/RANGE/PCT              83.5/ 3/ 1.59           44.2/ 2/ 1.46
   NOX SAMPLE METER/RANGE/PPM               3.4/ 3/  .08            1.4/ 2/  .07
   NOX BCKGRD METER/RANGE/PPM              72.6/ 2/   73           40.6/ 3/  122
   HC  CONCENTRATION PPM                     .8/ 2/    1            1.7/ 2/    2
   CO  CONCENTRATION PPM                         42                      88
   CO2 CONCENTRATION PCT                        394                     381
   NOX CONCENTRATION PPM                       1.50                    1.40
   HC  MASS GRAMS                              71.4                   120.4
   CO  MASS GRAMS                             11.12                    4.85
   CO2 MASS GRAMS                            212.45                   51.00
   NOX MASS GRAMS                            5735.1                  4006.5
       DFC. WET (DRY)                         28.08                   25.05
       SCF. WET (DRY)                      .878 ( .864)            .850 ( .841)
       VOL (SCM)                          1.000 ( .976)           1.000 ( .971)
       KM  (MEASURED)                         209.2                   114.9
                                              21.98                   16.67
   TEST NUMBER,             PVMT
   BAROMETER,               MM HG             114-32                  114-33
   HUMIDITY,                G/KG               739.6                   739.6
   TEMPERATURE,             DEG C               10.0                    10.0
   TOTAL FUEL SULFUR,       MG/KM               25.0                    23.3
                                               25.71                   22.00
   AVG. EXH. OXYGEN,        PCT
   CATALYST AVG. TEMP.,     DEG C               5.04                    4.40
   CATALYST MAX. TEMP.,     DEG C                 -                       -
   CARBON DIOXIDE,          G/KM                  -                       -
   FUEL CONSUMPTION,        L/100KM            269.0                   293.3
                                               12.00                   10.69
   HYDROCARBONS,            G/KM
   CARBON MONOXIDE,         G/KM                 .61                     .34
   OXIDES OF NITROGEN,      G/KM                4.80                    3.10
                                                1.24                    1.57
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TABLE E-13. TEST 121 EMISSIONS RESULTS

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                     PVM - 121   FTP   VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                   PROJECT 11-4771-001

TEST NO.   121-11   RUN   1                 VEHICLE NO.      12                 TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL    78 CHEV. MALIBU            DATE    5/11/78                     ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                   BAG CART NO.  1                     GASOLINE  EM-399
TRANSMISSION A3                             DYNO NO.      3                     ODOMETER   1753 KM(  1089 MILES)
GVW  2040 KG(  4498 LBS)                    CVS NO.       2

BAROMETER 741.93 MM HG(29.21 IN HG)         DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)
RELATIVE HUMIDITY 59 PCT                    ABS. HUMIDITY 11.6 GM/KG            NOX HUMIDITY CORRECTION FACTOR  1.03
BAG RESULTS
  BAG NUMBER                                      1                  2                  3                  4
  DESCRIPTION                               COLD TRANSIENT       STABILIZED       HOT TRANSIENT        STABILIZED

  BLOWER DIF P MM. H2O(IN. H2O)             762.0 (30.0)       762.0 (30.0)       762.0 (30.0)       762.0 (30.0)
  BLOWER INLET P MM. H2O(IN. H2O)           762.0 (30.0)       762.0 (30.0)       762.0 (30.0)       762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)          43.9 (111.0)       43.3 (110.0)       43.3 (110.0)       43.3 (110.0)
  BLOWER REVOLUTIONS                            40606              69552              40631              69391
  CVS FLOW STD. CU. METRES(SCF)             76.0 (2684.5)     130.3 (4602.3)      76.1 (2688.6)     130.0 (4591.3)
  HC  SAMPLE METER/RANGE/PPM                16.3/ 3/  163      18.5/ 2/   18      27.1/ 2/   27      16.5/ 2/   16
  HC  BCKGRD METER/RANGE/PPM                 1.5/ 3/   15      15.3/ 2/   15      19.6/ 2/   19      17.6/ 2/   17
  CO  SAMPLE METER/RANGE/PPM                56.5/ 3/ 1408      29.0/13/   23      57.0/12/  127       7.9/13/    7
  CO  BCKGRD METER/RANGE/PPM                  .2/ 3/    1       4.9/13/    4       1.3/12/    2       2.7/13/    3
  CO2 SAMPLE METER/RANGE/PCT                79.8/ 3/ 1.35      53.8/ 3/  .94      66.0/ 3/ 1.18      52.9/ 3/  .92
  CO2 BCKGRD METER/RANGE/PCT                 4.1/ 3/  .06       4.2/ 3/  .06       4.6/ 3/  .07       4.3/ 3/  .07
  NOX SAMPLE METER/RANGE/PPM                35.6/ 2/   36      19.6/ 2/   20      34.8/ 2/   34      22.0/ 2/   22
  NOX BCKGRD METER/RANGE/PPM                  .9/ 2/    1        .9/ 2/    1        .8/ 2/    1        .8/ 2/    1
  DILUTION FACTOR                               9.95              14.18              11.19              14.98

  HC  CONCENTRATION PPM                          150                  4                 10                  3
  CO  CONCENTRATION PPM                         1390                 18                119                  5
  CO2 CONCENTRATION PCT                         1.29                .88               1.12                .86
  NOX CONCENTRATION PPM                         34.8               18.8               33.5               21.3
  HC  MASS GRAMS                                6.56                .32                .61                .25
  CO  MASS GRAMS                              118.63               2.73              10.59                .68
  CO2 MASS GRAMS                              1795.6             2102.0             1559.5             2051.6
  NOX MASS GRAMS                                5.21               4.88               5.02               5.44

  HC  GRAMS/KM                                  1.14                .05                .10                .04
  CO  GRAMS/KM                                 20.66                .45               1.83                .11
  CO2 GRAMS/KM                                 312.6              346.2              269.6              338.2
  NOX GRAMS/KM                                   .91                .79                .87                .90
  FUEL CONSUMPTION BY CB L/100KM               14.88              14.81              11.69              14.45

  RUN TIME               SECONDS                 505                866                506                866
  AVG. EXH. OXYGEN       PERCENT                2.15               2.50               2.70               2.75
  CATALYST AVG. TEMP.    DEG. C                  215                436                392                448
  CATALYST MAX. TEMP.    DEG. C                  419                463                474                469
  MEASURED DISTANCE      KM                     5.74               6.07               5.78               6.07
       DFC, WET (DRY)                                  .919 ( .903)                          .923 ( .912)
       SCF, WET (DRY)                                 1.000 ( .977)                         1.000 ( .978)
       VOL (SCM)                                          206.3                                 206.1
       KM  (MEASURED)                                     11.81                                 11.85

COMPOSITE RESULTS                                                                                          3-BAG         (4-BAG)
  TEST NUMBER             121-11     TOTAL FUEL SULFUR    MG/KM   20.66      CARBON DIOXIDE       G/KM      317.8        ( 315.5)
  BAROMETER     MM HG     741.9      AVG. EXH. OXYGEN     PCT      2.50      FUEL CONSUMPTION     L/100KM   13.95        ( 13.89)
  HUMIDITY      G/KG       11.6      CATALYST AVG. TEMP. DEG C      392      HYDROCARBONS (THC)   G/KM        .40        (   .39)
  TEMPERATURE   DEG C      24.4      CATALYST MAX. TEMP. DEG C      474      CARBON MONOXIDE      G/KM       5.06        (  4.96)
                                                                              OXIDES OF NITROGEN   G/KM        .84        (   .87)


                              PVM - 121    SET  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                                PROJECT 11-4771-001

VEHICLE MODEL    78 CHEV. MALIBU                 VEHICLE NO.      12                 TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 5.0 L(305 CID) V-8                        TRANSMISSION A3                     ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
                                                 GVW  2040 KG(  4498 LBS)            GASOLINE  EM-399

  TEST NUMBER                                     121-12                  121-13
  TEST CYCLE                                       SET                     HFET
  RUN NUMBER                                        1                       1
  DATE                                           5/11/78                 5/11/78
  ODOMETER                                   1782KM(  1107MILES)     1802KM(  1120MILES)
  CVS - BAG CART - DYNAMOMETER                 2 - 1 - 3               2 - 1 - 3

  TEMPERATURE DEG. C (DEG. F)                 23.9 / 75.0             24.4 / 76.0
  RELATIVE HUMIDITY, PCT                         51.3                    45.0
  BAROMETER, MM HG(IN HG)                    741.9 (29.21)           741.9 (29.21)
  RUN TIME, SECONDS                              1397                     766

  BLOWER DIF P MM. H2O(IN. H2O)              762.0 (30.0)            762.0 (30.0)
  BLOWER INLET P MM. H2O(IN. H2O)            762.0 (30.0)            762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)           43.3 (110.0)            43.3 (110.0)
  BLOWER REVOLUTIONS                            118854                   61986
  CVS FLOW STD. CU. METRES(SCF)              210.3 (7428.2)          115.2 (4068.6)
  HC  SAMPLE METER/RANGE/PPM                 22.4/ 2/   22           22.3/ 2/   22
  HC  BCKGRD METER/RANGE/PPM                 14.8/ 2/   15           14.9/ 2/   15
  CO  SAMPLE METER/RANGE/PPM                 51.7/12/  119           76.6/13/   76
  CO  BCKGRD METER/RANGE/PPM                  1.0/12/    2            1.6/13/    2
  CO2 SAMPLE METER/RANGE/PCT                 80.1/ 3/ 1.47           91.4/ 3/ 1.71
  CO2 BCKGRD METER/RANGE/PCT                  4.8/ 3/  .07            3.3/ 3/  .05
  NOX SAMPLE METER/RANGE/PPM                 53.1/ 2/   53           76.1/ 2/   76
  NOX BCKGRD METER/RANGE/PPM                   .8/ 2/    1             .9/ 2/    1
  HC  CONCENTRATION PPM                            9                       9
  CO  CONCENTRATION PPM                           100                      71
  CO2 CONCENTRATION PCT                          1.41                    1.66
  NOX CONCENTRATION PPM                          52.4                    75.3
  HC  MASS GRAMS                                 1.12                     .62
  CO  MASS GRAMS                                26.35                    9.47
  CO2 MASS GRAMS                               5915.6                  3509.3
  NOX MASS GRAMS                                20.90                   15.61
       DFC, WET (DRY)                        .889 ( .880)            .872 ( .865)
       SCF, WET (DRY)                       1.000 ( .976)           1.000 ( .976)
       VOL (SCM)                                210.3                   115.2
       KM  (MEASURED)                           21.59                   16.26

  TEST NUMBER,          PVMT                   121-12                  121-13
  BAROMETER,            MM HG                   741.9                   741.9
  HUMIDITY,             G/KG                      9.7                     8.8
  TEMPERATURE,          DEG C                    23.9                    24.4
  TOTAL FUEL SULFUR,    MG/KM                   22.29                   19.03

  AVG. EXH. OXYGEN,     PCT                      2.05                    1.50
  CATALYST AVG. TEMP.,  DEG C                     499                     515
  CATALYST MAX. TEMP.,  DEG C                     576                     589
  CARBON DIOXIDE,       G/KM                    251.5                   215.9
  FUEL CONSUMPTION,     L/100KM                 10.82                    9.26

  HYDROCARBONS,         G/KM                      .05                     .04
  CARBON MONOXIDE,      G/KM                     1.22                     .58
  OXIDES OF NITROGEN,   G/KM                      .95                     .96
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TABLE E-14. TEST 121 EMISSIONS RESULTS

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                        PVM - 121   FTP  VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
                                         PROJECT 11-4771-001

TEST NO.   121-21   RUN   1
VEHICLE MODEL   78 CHEV. MALIBU          VEHICLE NO.    12                    TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 5.0 L(305 CID) V-8                DATE    5/17/78                      ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
TRANSMISSION A3                          BAG CART NO.  1                      GASOLINE  EM-399
GVW  2040 KG(  4498 LBS)                 DYNO NO.      3                      ODOMETER   2132 KM(  1325 MILES)
                                         CVS NO.       2
BAROMETER 733.30 MM HG(28.87 IN HG)
RELATIVE HUMIDITY 51 PCT                 DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)
BAG RESULTS                              ABS. HUMIDITY   9.9 GM/KG
                                                                              NOX HUMIDITY CORRECTION FACTOR   .97
   BAG NUMBER
   DESCRIPTION                                 1                  2                   3                   4
                                         COLD TRANSIENT       STABILIZED        HOT TRANSIENT         STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)         762.0 (30.0)       762.0 (30.0)       762.0 (30.0)        762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)       762.0 (30.0)       762.0 (30.0)       762.0 (30.0)        762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)      43.9 (111.0)       43.9 (111.0)       43.3 (110.0)        43.3 (110.0)
   BLOWER REVOLUTIONS                       40891              69379              40590               69490
   CVS FLOW STD. CU. METRES(SCF)          75.6 (2668.7)     128.2 (4527.6)      75.1 (2651.5)      128.5 (4539.5)
   HC  SAMPLE METER/RANGE/PPM           82.2/ 3/  222     10.5/ 3/  105      96.9/ 2/   97       91.7/ 2/   92
   HC  BCKGRD METER/RANGE/PPM            1.5/ 3/   15      1.6/ 3/   16      19.3/ 2/   19       13.0/ 2/   13
   CO  SAMPLE METER/RANGE/PPM           93.9/ 3/ 2667     40.8/ 3/ 1190      37.7/ 3/  895       40.9/ 3/  965
   CO  BCKGRD METER/RANGE/PPM             .1/ 3/    2       .3/ 3/    7        .2/ 3/    5         .1/ 3/    2
   CO2 SAMPLE METER/RANGE/PCT           71.2/ 3/ 1.29     50.8/ 3/  .80      65.0/ 3/ 1.16       49.5/ 3/  .86
   CO2 BCKGRD METER/RANGE/PCT            2.0/ 3/  .04      3.0/ 3/  .06       4.4/ 3/  .08        4.0/ 3/  .07
   NOX SAMPLE METER/RANGE/PPM           35.9/ 2/   36     13.0/ 2/   13      26.8/ 2/   27       13.6/ 2/   14
   NOX BCKGRD METER/RANGE/PPM            1.0/ 2/    1       .9/ 2/    1       1.3/ 2/    1        1.1/ 2/    1
   DILUTION FACTOR                          8.55               13.29              10.65               13.96

   HC  CONCENTRATION PPM                    209                 90                 84                  80
   CO  CONCENTRATION PPM                   2554               1144                856                 931
   CO2 CONCENTRATION PCT                   1.25                .83               1.09                 .79
   NOX CONCENTRATION PPM                   35.0               12.2               25.6                12.6
   HC  MASS GRAMS                          9.10               6.67               3.63                5.90
   CO  MASS GRAMS                        224.79             170.73              74.83              139.31
   CO2 MASS GRAMS                        1730.0             1945.4             1509.9              1856.9
   NOX MASS GRAMS                          4.92               2.90               3.58                3.01

   HC  GRAMS/KM                            1.57               1.09                .63                 .96
   CO  GRAMS/KM                           38.79              27.96              13.05               22.71
   CO2 GRAMS/KM                           298.7              318.6              262.9               302.7
   NOX GRAMS/KM                             .85                .47                .62                 .49
   FUEL CONSUMPTION BY CB L/100KM         15.56              15.62              12.16               14.57

   RUN TIME             SECONDS             505                867                505                 867
   AVG. EXH. OXYGEN     PERCENT            1.35               0.95               1.25                0.95
   CATALYST AVG. TEMP.  DEG. C              209                416                371                 432
   CATALYST MAX. TEMP.  DEG. C              431                457                487                 466
   MEASURED DISTANCE    KM                 5.79               6.11               5.74                6.13
        DFC, WET (DRY)                              .909 ( .908)                          .920 ( .911)
        SCF, WET (DRY)                             1.000 ( .988)                         1.000 ( .981)
        VOL (SCM)                                         203.7                                 203.6
        KM  (MEASURED)                                    11.90                                 11.87

COMPOSITE RESULTS
   TEST NUMBER            121-21     TOTAL FUEL SULFUR    MG/KM    30.11                                   3-BAG        (4-BAG)
   BAROMETER     MM HG     733.3     AVG. EXH. OXYGEN     PCT       1.10     CARBON DIOXIDE       G/KM      298.9       ( 299.3)
   HUMIDITY      G/KG        9.9     CATALYST AVG. TEMP. DEG C       373     FUEL CONSUMPTION     L/100KM    14.65       ( 14.25)
   TEMPERATURE   DEG C      23.9     CATALYST MAX. TEMP. DEG C       487     HYDROCARBONS (THC)   G/KM        1.07       (  1.03)
                                                                             CARBON MONOXIDE      G/KM       26.11       ( 24.57)
                                                                             OXIDES OF NITROGEN   G/KM         .59       (   .60)
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                        PVM - 121   SET  VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
                                         PROJECT 11-4771-001

VEHICLE MODEL   78 CHEV. MALIBU          VEHICLE NO.    12                    TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 5.0 L(305 CID) V-8                TRANSMISSION A3                      ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
                                         GVW  2040 KG(  4498 LBS)             GASOLINE  EM-399
   TEST NUMBER
   TEST CYCLE                                121-22                     121-23
   RUN NUMBER                                 SET                        HFET
   DATE                                        1                          1
   ODOMETER                                 5/17/78                    5/17/78
   CVS - BAG CART - DYNAMOMETER          2158KM(  1341MILES)        2181KM(  1355MILES)
                                           2 - 1 - 3                  2 - 1 - 3
   TEMPERATURE DEG. C (DEG. F)
   RELATIVE HUMIDITY, PCT                  24.4 / 76.0                24.4 / 76.0
   BAROMETER, MM HG(IN HG)                     55.6                       55.6
   RUN TIME, SECONDS                      733.3 (28.87)              733.3 (28.87)
                                               1397                        767
   BLOWER DIF P MM. H2O(IN. H2O)
   BLOWER INLET P MM. H2O(IN. H2O)        762.0 (30.0)               762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)      762.0 (30.0)               762.0 (30.0)
   BLOWER REVOLUTIONS                      43.9 (111.0)               43.9 (111.0)
   CVS FLOW STD. CU. METRES(SCF)              110152                      61651
   HC  SAMPLE METER/RANGE/PPM            207.2 (7318.7)             113.9 (4023.5)
   HC  BCKGRD METER/RANGE/PPM            77.5/ 2/   78              36.3/ 2/   36
   CO  SAMPLE METER/RANGE/PPM            12.9/ 2/   12              12.8/ 2/   12
   CO  BCKGRD METER/RANGE/PPM            37.9/ 3/  900              73.8/11/  319
   CO2 SAMPLE METER/RANGE/PCT              .3/ 3/    7               8.1/11/    6
   CO2 BCKGRD METER/RANGE/PCT            81.7/ 3/ 1.50              91.9/ 2/ 1.84
   NOX SAMPLE METER/RANGE/PPM             4.6/ 3/  .07               1.8/ 2/  .07
   NOX BCKGRD METER/RANGE/PPM            48.9/ 2/   46              84.5/ 2/   84
   HC  CONCENTRATION PPM                   .9/ 2/    1                .9/ 2/    1
   CO  CONCENTRATION PPM                      67                         26
   CO2 CONCENTRATION PCT                     852                        297
   NOX CONCENTRATION PPM                     1.44                       1.78
   HC  MASS GRAMS                            45.1                       83.7
   CO  MASS GRAMS                            7.96                       1.70
   CO2 MASS GRAMS                          205.58                      39.35
   NOX MASS GRAMS                          5474.6                     3719.9
        DFC, WET (DRY)                      18.07                      18.49
        SCF, WET (DRY)                   .881 ( .871)               .860 ( .850)
        VOL (SCM)                       1.000 ( .975)              1.000 ( .971)
        KM  (MEASURED)                      207.2                      113.9
                                            21.58                      16.36
   TEST NUMBER,          PVMT
   BAROMETER,            MM HG              121-22                     121-23
   HUMIDITY,             G/KG               733.3                      733.3
   TEMPERATURE,          DEG C               11.0                       11.0
   TOTAL FUEL SULFUR,    MG/KM               24.4                       24.4
                                             23.67                      20.31
   AVG. EXH. OXYGEN,     PCT
   CATALYST AVG. TEMP.,  DEG C               0.65                       1.35
   CATALYST MAX. TEMP.,  DEG C                493                        517
   CARBON DIOXIDE,       G/KM                 619                        603
   FUEL CONSUMPTION,     L/100KM            253.7                      227.4
                                             11.50                       9.80
   HYDROCARBONS,         G/KM
   CARBON MONOXIDE,      G/KM                 .37                        .10
   OXIDES OF NITROGEN,   G/KM                9.53                       2.41
                                              .84                       1.13
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TABLE E-15. TEST 121 EMISSIONS RESULTS

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                       PVM - 121   FTP  VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
                                        PROJECT 11-4771-001

TEST NO.   121-31   RUN   1                      VEHICLE NO.      12                  TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL    78 CHEV. MALIBU                 DATE    5/18/78                      ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                        BAG CART NO.  1                      GASOLINE  EM-399
TRANSMISSION A3                                  DYNO NO.      3                      ODOMETER   2202 KM(  1368 MILES)
GVW  2040 KG(  4498 LBS)                         CVS NO.       2

BAROMETER 738.63 MM HG(29.08 IN HG)              DRY BULB TEMP. 24.9 DEG C(76.8 DEG F)
RELATIVE HUMIDITY 48 PCT                         ABS. HUMIDITY  9.5 GM/KG             NOX HUMIDITY CORRECTION FACTOR   .96
BAG RESULTS
   BAG NUMBER                                         1                  2                  3                  4
   DESCRIPTION                                 COLD TRANSIENT       STABILIZED        HOT TRANSIENT        STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)               736.6 (29.0)       749.3 (29.5)       749.3 (29.5)       749.3 (29.5)
   BLOWER INLET P MM. H2O(IN. H2O)             736.6 (29.0)       749.3 (29.5)       749.3 (29.5)       749.3 (29.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)            43.9 (111.0)       43.3 (110.0)       44.9 (112.8)       43.9 (111.0)
   BLOWER REVOLUTIONS                              40701              64999              40541              64548
   CVS FLOW STD. CU. METRES(SCF)               76.1 (2687.7)     129.8 (4584.2)      75.6 (2669.9)     129.8 (4583.3)
   HC  SAMPLE METER/RANGE/PPM                 29.8/ 3/  298      10.0/ 3/  100      93.1/ 2/   93      90.5/ 2/   90
   HC  BCKGRD METER/RANGE/PPM                  1.9/ 3/   19       1.3/ 3/   13      19.3/ 2/   19      19.1/ 2/   19
   CO  SAMPLE METER/RANGE/PPM                 96.0/ 3/ 2773      97.5/ 3/ 1159      39.8/ 3/  821      38.9/ 3/  913
   CO  BCKGRD METER/RANGE/PPM                   .2/ 3/    5        .1/ 3/    2        .2/ 3/    5        .3/ 3/    7
   CO2 SAMPLE METER/RANGE/PCT                 71.3/ 3/ 1.29      50.7/ 3/  .88      67.3/ 3/ 1.21      51.0/ 3/  .89
   CO2 BCKGRD METER/RANGE/PCT                  4.3/ 3/  .07       4.8/ 3/  .07       5.3/ 3/  .08       5.5/ 3/  .08
   NOX SAMPLE METER/RANGE/PPM                 33.9/ 2/   33      11.0/ 2/   11      25.9/ 2/   26      13.7/ 2/   14
   NOX BCKGRD METER/RANGE/PPM                   .8/ 2/    1        .7/ 2/    1        .7/ 2/    1        .8/ 2/    1
   DILUTION FACTOR                                  8.37              13.37              10.33              13.62

   HC  CONCENTRATION PPM                             296                 88                 80                 77
   CO  CONCENTRATION PPM                            2657               1115                785                877
   CO2 CONCENTRATION PCT                            1.23                .81               1.14                .81
   NOX CONCENTRATION PPM                            32.7               10.4               25.3               13.0
   HC  MASS GRAMS                                  10.39               6.59               3.50               5.80
   CO  MASS GRAMS                                 235.93             168.95              69.09             132.91
   CO2 MASS GRAMS                                 1717.5             1930.8             1571.8             1919.8
   NOX MASS GRAMS                                   4.50               2.47               3.52               3.10

   HC  GRAMS/KM                                     1.79               1.07                .61                .94
   CO  GRAMS/KM                                    40.67              27.42              12.00              21.57
   CO2 GRAMS/KM                                    296.7              319.2              272.9              318.5
   NOX GRAMS/KM                                      .79                .40                .61                .50
   FUEL CONSUMPTION BY CB L/100KM                  15.63              15.40              12.53              14.41

   RUN TIME              SECONDS                     505                866                505                867
   AVG. EXH. OXYGEN      PERCENT                    1.75               1.35               1.75               1.40
   CATALYST AVG. TEMP.   DEG. C                      348                411                364                420
   CATALYST MAX. TEMP.   DEG. C                      419                448                438                438
   MEASURED DISTANCE     KM                         5.79               6.19               5.76               6.19
        DFC, WET (DRY)                                     .909 ( .901)                          .918 ( .910)
        SCF, WET (DRY)                                    1.000 ( .981)                         1.000 ( .981)
        VOL (SCM)                                                 205.9                                 205.4
        KM  (MEASURED)                                            11.98                                 11.95
COMPOSITE RESULTS
   TEST NUMBER             121-31                                                                        3-BAG         (4-BAG)
   BAROMETER     MM HG  738.6      TOTAL FUEL SULFUR   MG/KM   30.13    CARBON DIOXIDE        G/KM       299.2       ( 298.7)
   HUMIDITY      G/KG     9.5      AVG. EXH. OXYGEN    PCT      1.50    FUEL CONSUMPTION      L/100KM    14.66       ( 14.51)
   TEMPERATURE   DEG C   24.9      CATALYST AVG. TEMP. DEG C     367    HYDROCARBONS (THC)    G/KM        1.09       (  1.06)
                                   CATALYST MAX. TEMP. DEG C     438    CARBON MONOXIDE       G/KM       25.93       ( 24.21)
                                                                        OXIDES OF NITROGEN    G/KM         .54       (   .57)


                       PVM - 121   SET  VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
                                        PROJECT 11-4771-001

VEHICLE MODEL    78 CHEV. MALIBU                 VEHICLE NO.      12                  TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 5.0 L(305 CID) V-8                        TRANSMISSION A3                      ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
                                                 GVW  2040 KG(  4498 LBS)             GASOLINE  EM-399

   TEST NUMBER                                   121-32                  121-33
   TEST CYCLE                                     SET                     HFET
   RUN NUMBER                                      1                       1
   DATE                                         5/18/78                 5/18/78
   ODOMETER                                 2231KM(  1386MILES)     2251KM(  1399MILES)
   CVS - BAG CART - DYNAMOMETER                2 - 1 - 3               2 - 1 - 3

   TEMPERATURE DEG. C (DEG. F)                25.0 / 77.0             25.0 / 77.0
   RELATIVE HUMIDITY, PCT                         45.7                    45.7
   BAROMETER, MM HG(IN HG)                    738.9 (29.09)           738.9 (29.09)
   RUN TIME, SECONDS                              1397                     766

   BLOWER DIF P MM. H2O(IN. H2O)              749.3 (29.5)            749.3 (29.5)
   BLOWER INLET P MM. H2O(IN. H2O)            749.3 (29.5)            749.3 (29.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)           43.9 (111.0)            43.9 (111.0)
   BLOWER REVOLUTIONS                            112025                   61972
   CVS FLOW STD. CU. METRES(SCF)             209.1 (7384.4)          114.7 (4052.7)
   HC  SAMPLE METER/RANGE/PPM                63.7/ 2/   64           33.9/ 2/   34
   HC  BCKGRD METER/RANGE/PPM                11.2/ 2/   11           13.4/ 2/   13
   CO  SAMPLE METER/RANGE/PPM                30.5/ 3/  719           85.7/12/  202
   CO  BCKGRD METER/RANGE/PPM                  .1/ 3/    2            2.1/12/    4
   CO2 SAMPLE METER/RANGE/PCT                88.6/ 3/ 1.52           41.0/ 2/ 1.79
   CO2 BCKGRD METER/RANGE/PCT                 4.1/ 3/  .06            1.7/ 2/  .06
   NOX SAMPLE METER/RANGE/PPM                52.9/ 2/   52           83.9/ 2/   84
   NOX BCKGRD METER/RANGE/PPM                 1.1/ 2/    1            1.2/ 2/    1
   HC  CONCENTRATION PPM                           54                      22
   CO  CONCENTRATION PPM                          688                     189
   CO2 CONCENTRATION PCT                          1.47                    1.74
   NOX CONCENTRATION PPM                          51.9                    82.9
   HC  MASS GRAMS                                 6.49                    1.48
   CO  MASS GRAMS                               165.61                   25.28
   CO2 MASS GRAMS                               5622.3                  3653.9
   NOX MASS GRAMS                                19.65                   17.37
        DFC, WET (DRY)                        .881 ( .873)            .865 ( .857)
        SCF, WET (DRY)                       1.000 ( .938)           1.000 ( .975)
        VOL (SCM)                                209.1                   114.7
        KM  (MEASURED)                           21.78                   16.26

   TEST NUMBER,            PVMT                 121-32                  121-33
   BAROMETER,              MM HG                 738.9                   738.9
   HUMIDITY,               G/KG                    9.3                     9.3
   TEMPERATURE,            DEG C                  25.0                    25.0
   TOTAL FUEL SULFUR,      MG/KM                 23.81                   19.95

   AVG. EXH. OXYGEN,       PCT                    1.20                    1.10
   CATALYST AVG. TEMP.,    DEG C                   443                     516
   CATALYST MAX. TEMP.,    DEG C                   601                     610
   CARBON DIOXIDE,         G/KM                  258.6                   224.7
   FUEL CONSUMPTION,       L/100KM               11.59                    9.71

   HYDROCARBONS,           G/KM                    .30                     .09
   CARBON MONOXIDE,        G/KM                   7.62                    1.55
   OXIDES OF NITROGEN,     G/KM                    .90                    1.07
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TABLE E-18. TEST 122 EMISSIONS RESULTS

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                      PVM - 122   FTP  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                       PROJECT 11-4771-001

TEST NO.   122-11   RUN   1
VEHICLE MODEL    78 CHEV. MALIBU            VEHICLE NO.   12                        TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 5.0 L(305 CID) V-8                   DATE     6/28/78                        ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
TRANSMISSION A3                             BAG CART NO.  1                         GASOLINE  EM-344
GVW  2040 KG(  4498 LBS)                    DYNO NO.      3                         ODOMETER   4928 KM(  3062 MILES)
                                            CVS NO.       2
BAROMETER 743.71 MM HG(29.28 IN HG)
RELATIVE HUMIDITY 61 PCT                    DRY BULB TEMP. 27.2 DEG C(81.0 DEG F)
BAG RESULTS                                 ABS. HUMIDITY 14.2 GM/KG                NOX HUMIDITY CORRECTION FACTOR  1.13
  BAG NUMBER                                        1                    2                    3                    4
  DESCRIPTION                               COLD TRANSIENT          STABILIZED          HOT TRANSIENT          STABILIZED

  BLOWER DIF P MM. H2O(IN. H2O)
  BLOWER INLET P MM. H2O(IN. H2O)           749.3 (29.5)         749.3 (29.5)         749.3 (29.5)         749.3 (29.5)
  BLOWER INLET TEMP. DEG. C(DEG. F)         749.3 (29.5)         749.3 (29.5)         749.3 (29.5)         749.3 (29.5)
  BLOWER REVOLUTIONS                         43.9 (111.0)         43.3 (110.0)         43.9 (111.0)         43.3 (110.0)
  CVS FLOW STD. CU. METRES(SCF)                40661                69587                40576                69520
  HC  SAMPLE METER/RANGE/PPM                 76.5 (2703.0)       131.1 (4629.8)        76.3 (2695.1)       130.9 (4625.1)
  HC  BCKGRD METER/RANGE/PPM                19.9/ 3/  199        12.1/ 2/   12        25.7/ 2/   26         9.6/ 2/   10
  CO  SAMPLE METER/RANGE/PPM                 1.0/ 3/   10         9.0/ 2/    9         7.8/ 2/    8         6.8/ 2/    7
  CO  BCKGRD METER/RANGE/PPM                59.6/ 3/ 1353        27.1/13/   25        62.7/11/  255        15.3/13/   14
  CO2 SAMPLE METER/RANGE/PCT                  .1/ 3/    2         4.1/13/    4          .8/11/    2         1.?/13/    1
  CO2 BCKGRD METER/RANGE/PCT                71.8/ 3/ 1.30        51.5/ 3/  .90        68.6/ 3/ 1.24        49.9/ 3/  .86
  NOX SAMPLE METER/RANGE/PPM                 2.9/ 3/  .04         3.0/ 3/  .05         4.8/ 3/  .07         4.5/ 3/  .07
  NOX BCKGRD METER/RANGE/PPM                28.3/ 2/   28        15.3/ 2/   15        25.6/ 2/   26        16.5/ 2/   16
  DILUTION FACTOR                             .7/ 2/    1         1.0/ 2/    1         1.4/ 2/    1         1.2/ 2/    :
                                                  9.28                14.84                10.61                15.68
  HC  CONCENTRATION PPM
  CO  CONCENTRATION PPM                            135                    4                   19                    3
  CO2 CONCENTRATION PCT                           1290                   20                  248                   13
  NOX CONCENTRATION PPM                           1.26                  .85                 1.17                  .79
  HC  MASS GRAMS                                  27.7                 14.4                 24.3                 15.4
  CO  MASS GRAMS                                  5.96                  .28                  .88                  .24
  CO2 MASS GRAMS                                114.97                 3.08                21.44                 1.93
  NOX MASS GRAMS                                1767.8               2048.4               1633.3               1896.5
                                                  4.58                 4.07                 4.02                 4.35
  HC  GRAMS/KM
  CO  GRAMS/KM                                    1.05                  .05                  .15                  .04
  CO2 GRAMS/KM                                   20.28                  .50                 3.80                  .31
  NOX GRAMS/KM                                   310.6                331.7                288.4                306.8
  FUEL CONSUMPTION BY CB L/100KM                   .80                  .66                  .71                  .70
                                                 14.76                14.20                12.61                13.18
  RUN TIME                 SECONDS
  AVG. EXH. OXYGEN         PERCENT                 505                  867                  505                  867
  CATALYST AVG. TEMP.  DEG. C                     1.99                 1.86                 2.02                 2.14
  CATALYST MAX. TEMP.  DEG. C                      199                  426                  372                  431
  MEASURED DISTANCE    KM                          418                  466                  474                  474
      DFC, WET (DRY)                              5.69                 6.18                 5.65                 6.18
      SCF, WET (DRY)                                     .918 ( .906)                              .925 ( .912)
      VOL (SCM)                                         1.000 ( .977)                             1.000 ( .977)
      KM  (MEASURED)                                           207.6                                     207.3
                                                                11.87                                     11.84
COMPOSITE RESULTS
  TEST NUMBER              122-11                                                                   3-BAG         (4-BAG)
  BAROMETER     MM HG  743.7    TOTAL FUEL SULFUR   MG/KM   24.74     CARBON DIOXIDE       G/KM       315.7       ( 308.3)
  HUMIDITY      G/KG    14.2    AVG. EXH. OXYGEN    PCT      1.83     FUEL CONSUMPTION     L/100KM    13.88       ( 13.56)
  TEMPERATURE   DEG C   27.2    CATALYST AVG. TEMP. DEG C     378     HYDROCARBONS (THC)   G/KM         .28       (   .28)
                                CATALYST MAX. TEMP. DEG C     474     CARBON MONOXIDE      G/KM        5.96       (  5.91)
                                                                      OXIDES OF NITROGEN   G/KM         .70       (   .72)


                      PVM - 122   SET  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                       PROJECT 11-4771-001

VEHICLE MODEL    78 CHEV. MALIBU            VEHICLE NO.     12                     TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 5.0 L(305 CID) V-8                   TRANSMISSION A3                        ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
                                            GVW  2040 KG(  4498 LBS)               GASOLINE  EM-344
  TEST NUMBER
  TEST CYCLE                                  122-12                  122-13
  RUN NUMBER                                   SET                     HFET
  DATE                                          1                       2
  ODOMETER                                   6/28/78                 6/28/78
  CVS - BAG CART - DYNAMOMETER          4955KM(  3079MILES)     5023KM(  3121MILES)              / /
                                             2 - 1 - 3               2 - 1 - 3
  TEMPERATURE DEG. C (DEG. F)
  RELATIVE HUMIDITY, PCT                    26.7 / 80.0             26.7 / 80.0
  BAROMETER, MM HG(IN HG)                       50.0                    47.5
  RUN TIME, SECONDS                        744.5 (29.31)           742.9 (29.25)
                                                1397                     765
  BLOWER DIF P MM. H2O(IN. H2O)
  BLOWER INLET P MM. H2O(IN. H2O)          749.3 (29.5)            749.3 (29.5)
  BLOWER INLET TEMP. DEG. C(DEG. F)        749.3 (29.5)            749.3 (29.5)
  BLOWER REVOLUTIONS                        43.3 (110.0)            43.9 (111.0)
  CVS FLOW STD. CU. METRES(SCF)               112117                   68282
  HC  SAMPLE METER/RANGE/PPM              211.4 (7467.8)          117.2 (4137.8)
  HC  BCKGRD METER/RANGE/PPM               17.7/ 2/   18           10.9/ 2/   11
  CO  SAMPLE METER/RANGE/PPM                7.9/ 2/    8            6.2/ 2/    6
  CO  BCKGRD METER/RANGE/PPM               71.8/12/  163           26.0/13/   24
  CO2 SAMPLE METER/RANGE/PCT                4.1/ 2/   43            1.0/13/    1
  CO2 BCKGRD METER/RANGE/PCT               78.5/ 3/ 1.44           93.4/ 3/ 1.76
  NOX SAMPLE METER/RANGE/PPM                3.9/ 3/  .06            3.9/ 3/  .06
  NOX BCKGRD METER/RANGE/PPM               51.8/ 2/   52           83.8/ 2/   84
  HC  CONCENTRATION PPM                     2.0/ 2/    2            2.3/ 2/    2
  CO  CONCENTRATION PPM                          11                       6
  CO2 CONCENTRATION PCT                          74                      22
  NOX CONCENTRATION PPM                        1.39                    1.71
  HC  MASS GRAMS                               50.0                    81.8
  CO  MASS GRAMS                               1.30                     .37
  CO2 MASS GRAMS                              18.32                    2.97
  NOX MASS GRAMS                             5369.0                  3669.8
      DFC, WET (DRY)                          20.64                   18.27
      SCF, WET (DRY)                      .891 ( .882)            .868 ( .861)
      VOL (SCM)                          1.000 ( .977)           1.000 ( .975)
      KM  (MEASURED)                          211.4                   117.2
                                              21.53                   16.27
  TEST NUMBER,           PVMT
  BAROMETER,             MM HG                122-12                  122-13
  HUMIDITY,              G/KG                  744.5                   742.9
  TEMPERATURE,           DEG C                  11.3                    10.6
  TOTAL FUEL SULFUR,     MG/KM                  26.7                    26.7
                                               22.43                   20.64
  AVG. EXH. OXYGEN,      PCT
  CATALYST AVG. TEMP.,   DEG C                  1.73                    1.93
  CATALYST MAX. TEMP.,   DEG C                   490                     557
  CARBON DIOXIDE,        G/KM                    584                     597
  FUEL CONSUMPTION,      L/100KM               249.2                   225.3
                                               10.70                    9.63
  HYDROCARBONS,          G/KM
  CARBON MONOXIDE,       G/KM                    .06                     .02
  OXIDES OF NITROGEN,    G/KM                    .85                     .18
                                                 .96                    1.12
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TABLE E-17. TEST 122 EMISSIONS RESULTS

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                                 PVM - 122   FTP  VEHICLE EMISSIONS RESULTS - IGNITION MISFIRE  12
                                                  PROJECT 11-4771-001

TEST NO.   122-21   RUN   1                          VEHICLE NO.   12                        TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 CHEV. MALIBU                      DATE    7/17/78                         ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                            BAG CART NO.  1                         GASOLINE  EM-399
TRANSMISSION A3                                      DYNO NO.      3                         ODOMETER   5818 KM(  3615 MILES)
GVW  2040 KG(  4498 LBS)                             CVS NO.       2

BAROMETER 739.14 MM HG(29.10 IN HG)                  DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)
RELATIVE HUMIDITY 57 PCT                             ABS. HUMIDITY  9.8 GM/KG                NOX HUMIDITY CORRECTION FACTOR   .97
BAG RESULTS
   BAG NUMBER                                             1                   2                   3                    4
   DESCRIPTION                                     COLD TRANSIENT         STABILIZED        HOT TRANSIENT          STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)                    762.0 (30.0)        762.0 (30.0)        762.0 (30.0)        762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)                  762.0 (30.0)        762.0 (30.0)        762.0 (30.0)        762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)                 43.3 (110.0)        43.3 (110.0)        43.3 (110.0)        43.3 (110.0)
   BLOWER REVOLUTIONS                                  40667               69637               40673               69570
   CVS FLOW STD. CU. METRES(SCF)                     76.0 (2682.8)      130.1 (4593.9)       76.0 (2683.2)      129.9 (4588.0)
   HC  SAMPLE METER/RANGE/PPM                        9.8/ 4/  980        20.0/ 2/   20        93.9/ 2/   94        17.6/ 2/   17
   HC  BCKGRD METER/RANGE/PPM                        0.0/ 4/    0         9.9/ 2/   10         8.6/ 2/    9         8.4/ 2/    8
   CO  SAMPLE METER/RANGE/PPM                       67.5/ 3/ 1792        61.5/13/   49        71.3/11/  307        53.6/13/   43
   CO  BCKGRD METER/RANGE/PPM                        1.0/ 3/   23        14.3/13/   14         2.7/11/    8         7.1/13/    7
   CO2 SAMPLE METER/RANGE/PCT                       75.2/ 3/ 1.37        59.4/ 3/  .95        71.7/ 3/ 1.30        50.3/ 3/  .87
   CO2 BCKGRD METER/RANGE/PCT                        4.1/ 3/  .06         4.0/ 3/  .06         4.6/ 3/  .07         4.9/ 3/  .07
   NOX SAMPLE METER/RANGE/PPM                       42.7/ 2/   43        25.3/ 2/   25        35.7/ 2/   36        25.8/ 2/   26
   NOX BCKGRD METER/RANGE/PPM                        1.2/ 2/    1         1.0/ 2/    1         1.1/ 2/    1         1.2/ 2/    1
   DILUTION FACTOR                                      8.20               13.97               10.08               15.26

   HC  CONCENTRATION PPM                                980                  11                  86                  10
   CO  CONCENTRATION PPM                               1644                  35                 286                  35
   CO2 CONCENTRATION PCT                               1.32                 .90                1.24                 .81
   NOX CONCENTRATION PPM                               41.6                24.4                34.7                24.7
   HC  MASS GRAMS                                     42.93                 .81                3.78                 .71
   CO  MASS GRAMS                                    145.42                5.39               25.32                5.25
   CO2 MASS GRAMS                                    1829.7              2132.9              1718.9              1925.6
   NOX MASS GRAMS                                      5.87                5.89                4.90                5.95

   HC  GRAMS/KM                                        7.39                 .13                 .65                 .12
   CO  GRAMS/KM                                       25.03                 .86                4.37                 .85
   CO2 GRAMS/KM                                       315.0               342.2               296.6               311.2
   NOX GRAMS/KM                                        1.01                 .94                 .85                 .96
   FUEL CONSUMPTION BY CB L/100KM                     16.18               14.68               13.09               13.36

   RUN TIME              SECONDS                        505                 867                 505                 867
   AVG. EXH. OXYGEN      PERCENT                       2.58                2.66                1.93                2.91
   CATALYST AVG. TEMP.   DEG. C                         231                 557                 466                 576
   CATALYST MAX. TEMP.   DEG. C                         525                 610                 636                 640
   MEASURED DISTANCE     KM                            5.81                6.23                5.79                6.19
        DFC, WET (DRY)                                          .910 ( .899)                            .922 ( .911)
        SCF, WET (DRY)                                         1.000 ( .978)                           1.000 ( .979)
        VOL (SCM)                                                     206.0                                   205.9
        KM  (MEASURED)                                                12.04                                   11.98

COMPOSITE RESULTS                                                                                          3-BAG          (4-BAG)
   TEST NUMBER            122-21       TOTAL FUEL SULFUR   MG/KM    31.19        CARBON DIOXIDE       G/KM       324.0         ( 319.9)
   BAROMETER      MM HG   739.1        AVG. EXH. OXYGEN    PCT       2.49        FUEL CONSUMPTION     L/100KM    14.53         ( 14.14)
   HUMIDITY       G/KG      9.8        CATALYST AVG. TEMP. DEG C     486         HYDROCARBONS (THC)   G/KM        1.78         (  1.78)
   TEMPERATURE    DEG C    22.2        CATALYST MAX. TEMP. DEG C     636         CARBON MONOXIDE      G/KM        6.89         (  6.89)
                                                                                 OXIDES OF NITROGEN   G/KM         .93         (   .94)
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                                 PVM - 122   SBT  VEHICLE EMISSIONS RESULTS - IGNITION MISFIRE  12
                                                  PROJECT 11-4771-001

                                                  VEHICLE NO.     12                      TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 CHEV. MALIBU                   TRANSMISSION A3                         ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                         GVW  2040 KG(  4498 LBS)                GASOLINE  EM-399

   TEST NUMBER                                       122-22                 122-23
   TEST CYCLE                                         SET                    HFET
   RUN NUMBER                                          1                      1
   DATE                                             7/17/78                7/17/78
   ODOMETER                                    5847KM(  3633MILES)    5884KM(  3656MILES)
   CVS - BAG CART - DYNAMOMETER                      2 - 1 - 3              2 - 1 - 3

   TEMPERATURE DEG. C (DEG. F)                      22.8 / 73.0            25.6 / 78.0
   RELATIVE HUMIDITY, PCT                              46.5                   39.9
   BAROMETER, MM HG(IN HG)                        739.1 (29.10)          739.1 (29.10)
   RUN TIME, SECONDS                                   1397                   768

   BLOWER DIF P MM. H2O(IN. H2O)                  762.0 (30.0)           762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)                762.0 (30.0)           762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)               43.3 (110.0)           43.3 (110.0)
   BLOWER REVOLUTIONS                                 112127                  61967
   CVS FLOW STD. CU. METRES(SCF)                  209.4 (7396.0)         119.8 (4229.0)
   HC  SAMPLE METER/RANGE/PPM                     56.8/ 2/   57          28.5/ 2/   28
   HC  BCKGRD METER/RANGE/PPM                      7.2/ 2/    7           6.5/ 2/    7
   CO  SAMPLE METER/RANGE/PPM                     89.2/11/  398          63.9/11/  262
   CO  BCKGRD METER/RANGE/PPM                      1.9/11/    4            .9/11/    3
   CO2 SAMPLE METER/RANGE/PCT                     35.0/ 2/ 1.49          43.1/ 2/ 1.90
   CO2 BCKGRD METER/RANGE/PCT                      1.6/ 2/  .06           1.9/ 2/  .07
   NOX SAMPLE METER/RANGE/PPM                     61.7/ 2/   62          96.7/ 2/   97
   NOX BCKGRD METER/RANGE/PPM                      1.5/ 2/    2           1.7/ 2/    2
   HC  CONCENTRATION PPM                              50                     23
   CO  CONCENTRATION PPM                             377                    247
   CO2 CONCENTRATION PCT                             1.43                   1.84
   NOX CONCENTRATION PPM                             60.4                   98.2
   HC  MASS GRAMS                                    6.09                   1.52
   CO  MASS GRAMS                                   91.89                  32.98
   CO2 MASS GRAMS                                  5500.5                 3956.0
   NOX MASS GRAMS                                   22.36                  19.41
        DFC, WET (DRY)                           .886 ( .878)           .856 ( .850)
        SCF, WET (DRY)                          1.000 ( .978)          1.000 ( .976)
        VUL (SCM)                                   209.4                  119.8
        KM  (MEASURED)                              21.70                  16.50

   TEST NUMBER,          PVMT                      122-22                 122-23
   BAROMETER,            MM HG                      739.1                  739.1
   HUMIDITY,             G/KG                         8.2                    8.4
   TEMPERATURE,          DEG C                       22.8                   25.6
   TOTAL FUEL SULFUR,    MG/KM                      23.87                  21.00

   AVG. EXH. OXYGEN,     PCT                         2.01                    .47
   CATALYST AVG. TEMP.,  DEG C                        632                    731
   CATALYST MAX. TEMP.,  DEG C                        756                    773
   CARBON DIOXIDE,       G/KM                       253.5                  239.9
   FUEL CONSUMPTION,     L/100KM                    11.14                  10.17

   HYDROCARBONS,         G/KM                         .28                    .09
   CARBON MONOXIDE,      G/KM                        4.23                   2.00
   OXIDES OF NITROGEN,   G/KM                        1.03                   1.18
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TABLE E-18. TEST 122 EMISSIONS RESULTS

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                    PVM - 122   FTP   VEHICLE EMISSIONS RESULTS - IGNITION MISFIRE
                                      PROJECT 11-4771-001

TEST NO.   122-31   RUN   1                 VEHICLE NO.   12                      TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 CHEV. MALIBU             DATE    7/18/78                       ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                   BAG CART NO.  1                       GASOLINE  EM-344
TRANSMISSION A3                             DYNO NO.      3                       ODOMETER   5900 KM(  3666 MILES)
GVW  2040 KG(  4498 LBS)                    CVS NO.       2

BAROMETER 739.39 MM HG(29.11 IN HG)         DRY BULB TEMP. 21.1 DEG C(70.0 DEG F)
RELATIVE HUMIDITY 64 PCT                    ABS. HUMIDITY 10.3 GM/KG
BAG RESULTS                                                                       NOX HUMIDITY CORRECTION FACTOR   .99
   BAG NUMBER                                     1                  2                  3                  4
   DESCRIPTION                              COLD TRANSIENT       STABILIZED       HOT TRANSIENT       STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)            762.0 (30.0)       762.0 (30.0)       762.0 (30.0)       762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)          762.0 (30.0)       762.0 (30.0)       762.0 (30.0)       762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)         43.3 (110.0)       43.3 (110.0)       43.3 (110.0)       43.3 (110.0)
   BLOWER REVOLUTIONS                          40547              69655              40542              69600
   CVS FLOW STD. CU. METRES(SCF)             75.9 (2679.2)     130.1 (4594.5)      75.7 (2675.3)     130.0 (4592.5)
   HC  SAMPLE METER/RANGE/PPM                9.8/ 4/  980      26.6/ 2/   27      12.2/ 3/  122      17.5/ 2/   18
   HC  BCKGRD METER/RANGE/PPM                 .1/ 4/   10      20.7/ 2/   21       2.2/ 3/   22      11.1/ 2/   11
   CO  SAMPLE METER/RANGE/PPM               66.3/ 3/ 1704      31.9/13/   29      80.6/11/  370      35.3/13/   31
   CO  BCKGRD METER/RANGE/PPM                 .2/ 3/    5      11.6/13/   11        .7/11/    2       2.0/13/    2
   CO2 SAMPLE METER/RANGE/PCT               79.2/ 3/ 1.35      53.6/ 3/  .94      71.5/ 3/ 1.29      49.6/ 3/  .86
   CO2 BCKGRD METER/RANGE/PCT                4.2/ 3/  .06       4.0/ 3/  .06       3.5/ 3/  .05       3.7/ 3/  .06
   NOX SAMPLE METER/RANGE/PPM               38.5/ 2/   38      24.6/ 2/   25      29.7/ 2/   30      29.9/ 2/   29
   NOX BCKGRD METER/RANGE/PPM                1.0/ 2/    1        .7/ 2/    1        .8/ 2/    1        .7/ 2/    1
   DILUTION FACTOR                                8.32              14.88               9.98              15.51

   HC  CONCENTRATION PPM                           971                  7                102                  7
   CO  CONCENTRATION PPM                          1620                 17                352                 28
   CO2 CONCENTRATION PCT                          1.29                .88               1.25                .81
   NOX CONCENTRATION PPM                          37.6               23.9               29.0               23.7
   HC  MASS GRAMS                                42.49                .55               4.47                .53
   CO  MASS GRAMS                               143.12               2.65              31.02               4.30
   CO2 MASS GRAMS                               1796.6             2097.0             1729.1             1920.1
   NOX MASS GRAMS                                 5.38               5.88               4.19               5.82

   HC  GRAMS/KM                                   7.36                .09                .77                .09
   CO  GRAMS/KM                                  24.78                .43               5.38                .69
   CO2 GRAMS/KM                                  311.0              338.1              300.0              309.0
   NOX GRAMS/KM                                    .93                .95                .72                .94
   FUEL CONSUMPTION BY CB L/100KM                15.93              14.47              13.27              13.25

   RUN TIME              SECONDS                   504                867                505                867
   AVG. EXH. OXYGEN      PERCENT                  2.83               1.98               1.94               2.67
   CATALYST AVG. TEMP.   DEG. C                    429                557                482                576
   CATALYST MAX. TEMP.   DEG. C                    529                610                627                623
   MEASURED DISTANCE     KM                       5.78               6.20               5.76               6.21
        DFC, WET (DRY)                                  .911 ( .898)                          .922 ( .909)
        SCF, WET (DRY)                                 1.000 ( .976)                         1.000 ( .976)
        VOL (SCM)                                             206.0                                 205.8
        KM  (MEASURED)                                        11.98                                 11.98
COMPOSITE RESULTS
   TEST NUMBER             122-31
   BAROMETER     MM HG  739.4      TOTAL FUEL SULFUR   MG/KM   30.96                                    3-BAG        (4-BAG)
   HUMIDITY      G/KG    10.3      AVG. EXH. OXYGEN    PCT      2.12    CARBON DIOXIDE        G/KM      322.1        ( 313.9)
   TEMPERATURE   DEG C   21.1      CATALYST AVG. TEMP. DEG C     484    FUEL CONSUMPTION      L/100KM   14.45        ( 14.08)
                                   CATALYST MAX. TEMP. DEG C     627    HYDROCARBONS (THC)    G/KM       1.78        (  1.78)
                                                                        CARBON MONOXIDE       G/KM       6.89        (  6.91)
                                                                        OXIDES OF NITROGEN    G/KM        .88        (   .88)
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                    PVM - 122   SET   VEHICLE EMISSIONS RESULTS - IGNITION MISFIRE
                                      PROJECT 11-4771-001

VEHICLE MODEL   78 CHEV. MALIBU             VEHICLE NO.   12                      TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 5.0 L(305 CID) V-8                   TRANSMISSION A3                       ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
                                            GVW  2040 KG(  4498 LBS)              GASOLINE  EM-344

   TEST NUMBER                                 122-32                 122-33
   TEST CYCLE                                   SET                    HFET
   RUN NUMBER                                    1                      1
   DATE                                       7/18/78                7/18/78
   ODOMETER                              5929KM(  3684MILES)    5963KM(  3706MILES)
   CVS - BAG CART - DYNAMOMETER                2 - 1 - 3              2 - 1 - 3

   TEMPERATURE DEG. C (DEG. F)               23.9 / 75.0            25.6 / 78.0
   RELATIVE HUMIDITY, PCT                        47.8                   46.9
   BAROMETER, MM HG(IN HG)                  739.6 (29.12)          739.6 (29.12)
   RUN TIME, SECONDS                             1397                   766

   BLOWER DIF P MM. H2O(IN. H2O)            762.0 (30.0)           762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)          762.0 (30.0)           762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)         43.3 (110.0)           43.3 (110.0)
   BLOWER REVOLUTIONS                          112138                 61961
   CVS FLOW STD. CU. METRES(SCF)            209.6 (7402.3)         114.9 (4057.1)
   HC  SAMPLE METER/RANGE/PPM               57.1/ 2/   57          27.2/ 2/   27
   HC  BCKGRD METER/RANGE/PPM                8.4/ 2/    8           8.3/ 2/    8
   CO  SAMPLE METER/RANGE/PPM               87.0/11/  420          62.5/11/  259
   CO  BCKGRD METER/RANGE/PPM                1.3/11/    4            .8/11/    2
   CO2 SAMPLE METER/RANGE/PCT               83.4/ 3/ 1.54          93.5/ 2/ 1.92
   CO2 BCKGRD METER/RANGE/PCT                4.0/ 3/  .06           1.9/ 2/  .05
   NOX SAMPLE METER/RANGE/PPM               65.1/ 2/   65          37.2/ 3/  112
   NOX BCKGRD METER/RANGE/PPM                1.7/ 2/    2           1.7/ 2/    2
   HC  CONCENTRATION PPM                          50                     20
   CO  CONCENTRATION PPM                         398                    239
   CO2 CONCENTRATION PCT                        1.49                   1.88
   NOX CONCENTRATION PPM                        63.6                  110.1
   HC  MASS GRAMS                               6.01                   1.33
   CO  MASS GRAMS                              97.05                  31.94
   CO2 MASS GRAMS                             5704.2                 3957.0
   NOX MASS GRAMS                              24.19                  23.44
        DFC, WET (DRY)                      .882 ( .879)           .859 ( .847)
        SCF, WET (DRY)                     1.000 ( .977)          1.000 ( .974)
        VOL (SCM)                              209.6                  114.9
        KM  (MEASURED)                         21.96                  16.52

   TEST NUMBER,          PVMT                 122-32                 122-33
   BAROMETER,            MM HG                 739.6                  739.6
   HUMIDITY,             G/KG                    9.1                    9.7
   TEMPERATURE,          DEG C                  23.9                   25.6
   TOTAL FUEL SULFUR,    MG/KM                 29.47                  22.22

   AVG. EXH. OXYGEN,     PCT                    1.74                    .93
   CATALYST AVG. TEMP.,  DEG C                   634                    712
   CATALYST MAX. TEMP.,  DEG C                   756                    777
   CARBON DIOXIDE,       G/KM                  259.7                  239.6
   FUEL CONSUMPTION,     L/100KM               11.42                  10.37

   HYDROCARBONS,         G/KM                    .27                    .08
   CARBON MONOXIDE,      G/KM                   4.42                   1.93
   OXIDES OF NITROGEN,   G/KM                   1.10                   1.42
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TABLE E-19. TEST 123 EMISSIONS RESULTS

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                         PVM - 123   FTP  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                          PROJECT 11-4771-001

TEST NO.   123-11   RUN   1                  VEHICLE NO.   12                TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 CHEV. MALIBU              DATE    8/ 3/78                 ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                    BAG CART NO.  1                 GASOLINE  EM-344
TRANSMISSION A3                              DYNO NO.      3                 ODOMETER   7601 KM(  4723 MILES)
GVW  2040 KG(  4498 LBS)                     CVS NO.       2

BAROMETER 742.70 MM HG(29.24 IN HG)          DRY BULB TEMP. 21.7 DEG C(71.0 DEG F)
RELATIVE HUMIDITY 69 PCT                     ABS. HUMIDITY 11.4 GM/KG        NOX HUMIDITY CORRECTION FACTOR  1.02
BAG RESULTS
  BAG NUMBER                                        1                  2                  3                  4
  DESCRIPTION                                COLD TRANSIENT       STABILIZED        HOT TRANSIENT        STABILIZED

  BLOWER DIF P MM. H2O(IN. H2O)              762.0 (30.0)       762.0 (30.0)       762.0 (30.0)       762.0 (30.0)
  BLOWER INLET P MM. H2O(IN. H2O)            762.0 (30.0)       762.0 (30.0)       762.0 (30.0)       762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)           43.3 (110.0)       43.3 (110.0)       43.3 (110.0)       43.3 (110.0)
  BLOWER REVOLUTIONS                            40575              69621              40526              69577
  CVS FLOW STD. CU. METRES(SCF)               76.2 (2690.4)     130.7 (4616.8)      76.1 (2687.4)     130.6 (4613.6)
  HC  SAMPLE METER/RANGE/PPM                 21.2/ 3/  212      16.8/ 2/   17      35.4/ 2/   36      12.9/ 2/   13
  HC  BCKGRD METER/RANGE/PPM                  1.9/ 3/   19      19.1/ 2/   19      11.9/ 2/   12      10.6/ 2/   11
  CO  SAMPLE METER/RANGE/PPM                 78.2/ 3/ 2097      15.5/13/   39      52.0/11/  199      15.6/13/   15
  CO  BCKGRD METER/RANGE/PPM                  1.1/ 3/   25      19.5/13/   18       2.3/11/    7       5.7/13/    6
  CO2 SAMPLE METER/RANGE/PCT                 76.6/ 3/ 1.40      51.7/ 3/  .90      69.5/ 3/ 1.25      49.7/ 3/  .86
  CO2 BCKGRD METER/RANGE/PCT                  4.7/ 3/  .07       4.5/ 3/  .07       5.0/ 3/  .08       4.1/ 3/  .06
  NOX SAMPLE METER/RANGE/PPM                 32.6/ 2/   33      15.8/ 2/   16      29.5/ 2/   29      17.8/ 2/   18
  NOX BCKGRD METER/RANGE/PPM                  2.0/ 2/    2       1.0/ 2/    1        .7/ 2/    1        .8/ 2/    1
  DILUTION FACTOR                                8.25              14.80              10.50              15.51

  HC  CONCENTRATION PPM                          195                  4                 25                  3
  CO  CONCENTRATION PPM                         1973                 21                183                  9
  CO2 CONCENTRATION PCT                         1.34                .84               1.18                .80
  NOX CONCENTRATION PPM                         30.8               14.9               28.4               17.1
  HC  MASS GRAMS                                8.58                .28               1.10                .22
  CO  MASS GRAMS                              175.01               3.17              16.29               1.37
  CO2 MASS GRAMS                              1869.6             2000.0             1650.9             1919.6
  NOX MASS GRAMS                                4.59               3.80               4.29               4.35

  HC  GRAMS/KM                                  1.49                .04                .19                .04
  CO  GRAMS/KM                                 30.33                .52               2.82                .22
  CO2 GRAMS/KM                                 324.0              326.8              286.9              313.5
  NOX GRAMS/KM                                   .80                .62                .75                .71
  FUEL CONSUMPTION BY CB L/100KM               16.07              13.99              12.96              13.90

  RUN TIME              SECONDS                  505                867                505                867
  AVG. EXH. OXYGEN      PERCENT                 1.37               2.20               2.10               2.58
  CATALYST AVG. TEMP.   DEG. C                   198                430                356                435
  CATALYST MAX. TEMP.   DEG. C                   423                466                464                478
  MEASURED DISTANCE     KM                      5.77               6.12               5.75               6.12
       DFC, WET (DRY)                                 .913 ( .898)                          .929 ( .910)
       SCF, WET (DRY)                                1.000 ( .979)                         1.000 ( .975)
       VOL (SCM)                                            206.9                                 206.7
       KM  (MEASURED)                                       11.89                                 11.88

COMPOSITE RESULTS
  TEST NUMBER          123-11                                                                3-BAG          (4-BAG)
  BAROMETER    MM HG   742.7     TOTAL FUEL SULFUR   MG/KM    30.80    CARBON DIOXIDE   G/KM    315.2         ( 311.3)
  HUMIDITY     G/KG     11.4     AVG. EXH. OXYGEN    PCT       2.05    FUEL CONSUMPTION L/100KM  14.00         ( 13.83)
  TEMPERATURE  DEG C    21.7     CATALYST AVG. TEMP. DEG C      378    HYDROCARBONS (THC) G/KM     .39         (   .38)
                                 CATALYST MAX. TEMP. DEG C      469    CARBON MONOXIDE  G/KM      7.48         (  7.29)
                                                                       OXIDES OF NITROGEN G/KM     .69         (   .72)


                         PVM - 123   SBT  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                          PROJECT 11-4771-001

                                             VEHICLE NO.    12               TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 CHEV. MALIBU              TRANSMISSION A3                 ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                    GVW  2040 KG(  4498 LBS)        GASOLINE  EM-344

  TEST NUMBER                                  123-12                123-13
  TEST CYCLE                                    SET                   HFET
  RUN NUMBER                                     1                     1
  DATE                                        8/ 3/78               8/ 3/78                    / /
  ODOMETER                               7640KM(  4747MILES)   7677KM(  4770MILES)
  CVS - BAG CART - DYNAMOMETER                2 - 1 - 3             2 - 1 - 3

  TEMPERATURE DEG. C (DEG. F)                22.8 / 73.0           23.3 / 74.0
  RELATIVE HUMIDITY, PCT                        50.0                  54.3
  BAROMETER, MM HG(IN HG)                  743.2 (29.26)         743.2 (29.26)
  RUN TIME, SECONDS                             1397                   766

  BLOWER DIF P MM. H2O(IN. H2O)             762.0 (30.0)          762.0 (30.0)
  BLOWER INLET P MM. H2O(IN. H2O)           762.0 (30.0)          762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)          43.3 (110.0)          43.3 (110.0)
  BLOWER REVOLUTIONS                           112261                61581
  CVS FLOW STD. CU. METRES(SCF)            210.9 (7450.2)        115.7 (4086.8)
  HC  SAMPLE METER/RANGE/PPM                16.8/ 2/   17         15.1/ 2/   15
  HC  BCKGRD METER/RANGE/PPM                 9.3/ 2/    9          8.7/ 2/    9
  CO  SAMPLE METER/RANGE/PPM                57.8/12/  129         57.3/12/  127
  CO  BCKGRD METER/RANGE/PPM                 1.5/12/    3          1.8/12/    3
  CO2 SAMPLE METER/RANGE/PCT                80.9/ 3/ 1.98         47.5/ 3/ 1.84
  CO2 BCKGRD METER/RANGE/PCT                 4.7/ 3/  .07          5.0/ 3/  .08
  NOX SAMPLE METER/RANGE/PPM                18.0/ 3/   54         81.8/ 2/   82
  NOX BCKGRD METER/RANGE/PPM                  .8/ 3/    2          2.0/ 2/    2
  HC  CONCENTRATION PPM                           9                     8
  CO  CONCENTRATION PPM                          121                   118
  CO2 CONCENTRATION PCT                         1.91                  1.77
  NOX CONCENTRATION PPM                         51.4                  80.1
  HC  MASS GRAMS                                1.04                   .51
  CO  MASS GRAMS                               29.64                 15.92
  CO2 MASS GRAMS                              5461.2                3749.6
  NOX MASS GRAMS                               19.70                 17.28
       DFC, WET (DRY)                       .884 ( .880)          .862 ( .852)
       SCF, WET (DRY)                      1.000 ( .977)         1.000 ( .972)
       VOL (SCM)                               210.9                 115.7
       KM  (MEASURED)                          21.57                 16.50

  TEST NUMBER,          PVMT                  123-12                123-13
  BAROMETER,            MM HG                 743.2                 743.2
  HUMIDITY,             G/KG                    8.8                   9.9
  TEMPERATURE,          DEG C                  22.8                  23.3
  TOTAL FUEL SULFUR,    MG/KM                 23.37                 20.99

  AVG. EXH. OXYGEN,     PCT                    1.86                  1.19
  CATALYST AVG. TEMP.,  DEG C                   494                   558
  CATALYST MAX. TEMP.,  DEG C                   576                   601
  CARBON DIOXIDE,       G/KM                  253.2                 227.3
  FUEL CONSUMPTION,     L/100KM               10.90                  9.77

  HYDROCARBONS,         G/KM                    .05                   .03
  CARBON MONOXIDE,      G/KM                   1.37                   .96
  OXIDES OF NITROGEN,   G/KM                    .91                  1.05
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TABLE E-20. TEST 123 EMISSIONS RESULTS

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PVM - 123   FTP  VEHICLE EMISSIONS RESULTS - DISABLED EGR
                 PROJECT 11-4771-001

TEST NO.   123-21   RUN  1              VEHICLE NO.  12
VEHICLE MODEL   78 CHEV. MALIBU         DATE   8/ 9/78                 TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 5.0 L(305 CID) V-8               BAG CART NO.  1                ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
TRANSMISSION A3                         DYNO NO.      3                GASOLINE  EM-399
GVW  2090 KG(  4608 LBS)                CVS NO.       2                ODOMETER   8003 KM(  4973 MILES)

BAROMETER 740.16 MM HG(29.14 IN HG)     DRY BULB TEMP. 21.7 DEG C(71.0 DEG F)
RELATIVE HUMIDITY 64 PCT                ABS. HUMIDITY 10.7 GM/KG       NOX HUMIDITY CORRECTION FACTOR  1.00
BAG RESULTS
  BAG NUMBER                                  1                 2                  3                  4
  DESCRIPTION                          COLD TRANSIENT      STABILIZED        HOT TRANSIENT        STABILIZED

  BLOWER DIF P MM. H2O(IN. H2O)         749.3 (29.5)      749.3 (29.5)       749.3 (29.5)       749.3 (29.5)
  BLOWER INLET P MM. H2O(IN. H2O)       749.3 (29.5)      749.3 (29.5)       749.3 (29.5)       749.3 (29.5)
  BLOWER INLET TEMP. DEG. C(DEG. F)      43.3 (110.0)      43.3 (110.0)       43.3 (110.0)       43.3 (110.0)
  BLOWER REVOLUTIONS                       40762             69621              40665              69662
  CVS FLOW STD. CU. METRES(SCF)         76.4 (2698.2)    130.5 (4607.9)      76.2 (2691.6)     130.5 (4609.2)
  HC  SAMPLE METER/RANGE/PPM           17.0/ 3/ 170      13.9/ 2/  14       29.6/ 2/  30       12.3/ 2/  12
  HC  BCKGRD METER/RANGE/PPM            1.0/ 3/  10       9.7/ 2/  10        9.4/ 2/   9        9.3/ 2/   9
  CO  SAMPLE METER/RANGE/PPM           60.3/ 3/ 1641     40.3/13/  35       47.0/12/ 252       15.8/13/  15
  CO  BCKGRD METER/RANGE/PPM             .5/ 3/  11       8.1/13/   8        1.9/12/   8        3.5/13/   3
  CO2 SAMPLE METER/RANGE/PCT           73.2/ 3/ 1.33     49.5/ 3/ .86       62.8/ 3/ 1.12      46.9/ 3/ .80
  CO2 BCKGRD METER/RANGE/PCT            4.0/ 3/ .06       3.8/ 3/ .06        3.8/ 3/ .06        3.6/ 3/ .06
  NOX SAMPLE METER/RANGE/PPM           49.0/ 2/  49      27.9/ 2/  28       48.0/ 2/  48       27.8/ 2/  28
  NOX BCKGRD METER/RANGE/PPM             .8/ 2/   1        .7/ 2/   1         .8/ 2/   1         .9/ 2/   1
  DILUTION FACTOR                           8.98             15.59              11.70              14.73

  HC  CONCENTRATION PPM                      161                4                 21                  4
  CO  CONCENTRATION PPM                     1595               27                230                 11
  CO2 CONCENTRATION PCT                     1.28              .80               1.07                .75
  NOX CONCENTRATION PPM                     48.3             27.2               47.3               27.0
  HC  MASS GRAMS                            7.10              .36                .92                .27
  CO  MASS GRAMS                          138.36             4.06              20.91               1.71
  CO2 MASS GRAMS                          1783.8           1918.4             1487.0             1783.5
  NOX MASS GRAMS                            6.32             6.80               6.89               6.73

  HC  GRAMS/KM                              1.23              .06                .16                .04
  CO  GRAMS/KM                             24.00              .66               3.55                .28
  CO2 GRAMS/KM                             309.4            311.3              258.4              287.8
  NOX GRAMS/KM                              1.10             1.10               1.20               1.09
  FUEL CONSUMPTION BY CB L/100KM           14.98            13.39              11.24              12.31

  RUN TIME                   SECONDS         506              867                505                867
  AVG. EXH. OXYGEN           PERCENT        1.73             2.54               2.33               2.64
  CATALYST AVG. TEMP.        DEG. C          189              418                363                437
  CATALYST MAX. TEMP.        DEG. C          419              453                474                482
  MEASURED DISTANCE          KM             5.76             6.16               5.76               6.20
     DFC. WET (DRY)                              .918 ( .905)                         .931 ( .917)
     SCF. WET (DRY)                             1.000 ( .976)                        1.000 ( .977)
     VOL (SCM)                                        206.9                                206.7
     KM  (MEASURED)                                   11.93                                11.95

COMPOSITE RESULTS
  TEST NUMBER           123-21
  BAROMETER     MM HG    740.2   TOTAL FUEL SULFUR   MG/KM   28.11   CARBON DIOXIDE        G/KM      3-BAG      (4-BAG)
  HUMIDITY      G/KG      10.7   AVG. EXH. OXYGEN    PCT      2.37   FUEL CONSUMPTION      L/100KM   296.9     ( 289.5)
  TEMPERATURE   DEG C     21.7   CATALYST AVG. TEMP. DEG C     371   HYDROCARBONS (THC)    G/KM      13.12     ( 12.81)
                                 CATALYST MAX. TEMP. DEG C     474   CARBON MONOXIDE       G/KM        .33     (   .33)
                                                                     OXIDES OF NITROGEN    G/KM       6.31     (  6.19)
                                                                                                      1.13     (  1.12)


PVM - 123   SET  VEHICLE EMISSIONS RESULTS - DISABLED EGR
                 PROJECT 11-4771-001

VEHICLE MODEL   78 CHEV. MALIBU         VEHICLE NO.   12
ENGINE 5.0 L(305 CID) V-8               TRANSMISSION A3                TEST WEIGHT   1588 KG(  3500 LBS)
                                        GVW  2090 KG(  4608 LBS)       ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
                                                                       GASOLINE  EM-399
  TEST NUMBER                            123-22                 123-23
  TEST CYCLE                              SET                    HFET
  RUN NUMBER                               1                      1
  DATE                                  8/ 9/78                8/ 9/78
  ODOMETER                        8032KM(  4991MILES)    8069KM(  5014MILES)                 /  /
  CVS - BAG CART - DYNAMOMETER            2 - 1 - 3              2 - 1 - 3

  TEMPERATURE DEG. C (DEG. F)           23.9 / 75.0            23.9 / 75.0
  RELATIVE HUMIDITY, PCT                   47.8                   49.3
  BAROMETER, MM HG(IN HG)              740.9 (29.17)          740.9 (29.17)
  RUN TIME, SECONDS                        1387                    766

  BLOWER DIF P MM. H2O(IN. H2O)         749.3 (29.5)           749.3 (29.5)
  BLOWER INLET P MM. H2O(IN. H2O)       749.3 (29.5)           749.3 (29.5)
  BLOWER INLET TEMP. DEG. C(DEG. F)      42.8 (109.0)           44.4 (112.0)
  BLOWER REVOLUTIONS                       112039                  61593
  CVS FLOW STD. CU. METRES(SCF)        210.5 (7433.3)         115.2 (4070.1)
  HC  SAMPLE METER/RANGE/PPM           19.6/ 2/  20           17.7/ 2/  18
  HC  BCKGRD METER/RANGE/PPM            9.7/ 2/  10            9.5/ 2/  10
  CO  SAMPLE METER/RANGE/PPM           72.3/12/ 169           57.7/12/ 128
  CO  BCKGRD METER/RANGE/PPM            1.3/12/   2            1.8/12/   3
  CO2 SAMPLE METER/RANGE/PCT           75.1/ 3/ 1.37          90.6/ 3/ 1.64
  CO2 BCKGRD METER/RANGE/PCT            3.8/ 3/ .06            3.8/ 3/ .06
  NOX SAMPLE METER/RANGE/PPM           81.6/ 2/  82           41.8/ 3/ 125
  NOX BCKGRD METER/RANGE/PPM            1.0/ 2/   1             .9/ 3/   1
  HC  CONCENTRATION PPM                     11                      9
  CO  CONCENTRATION PPM                    155                    120
  CO2 CONCENTRATION PCT                    1.32                   1.64
  NOX CONCENTRATION PPM                    80.5                  124.4
  HC  MASS GRAMS                           1.32                    .63
  CO  MASS GRAMS                          38.07                  16.07
  CO2 MASS GRAMS                         5073.1                 3460.8
  NOX MASS GRAMS                          30.73                  25.96
     DFC. WET (DRY)                    .897 ( .888)           .873 ( .866)
     SCF. WET (DRY)                   1.000 ( .978)          1.000 ( .976)
     VOL (SCM)                            210.5                  115.2
     KM  (MEASURED)                       21.59                  16.19

  TEST NUMBER,            PVMT           123-22                 123-23
  BAROMETER,              MM HG           740.9                  740.9
  HUMIDITY,               G/KG              9.0                    8.4
  TEMPERATURE,            DEG C            23.9                   23.9
  TOTAL FUEL SULFUR,      MG/KM           21.82                  19.71

  AVG. EXH. OXYGEN,       PCT              1.70                   1.07
  CATALYST AVG. TEMP.,    DEG C             501                    563
  CATALYST MAX. TEMP.,    DEG C             641                    618
  CARBON DIOXIDE,         G/KM            235.6                  213.8
  FUEL CONSUMPTION,       L/100KM         10.19                   9.29

  HYDROCARBONS,           G/KM              .06                    .04
  CARBON MONOXIDE,        G/KM             1.77                    .99
  OXIDES OF NITROGEN,     G/KM             1.43                   1.60
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TABLE E-21. TEST 123 EMISSIONS RESULTS

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                       PVM - 123   FTP   VEHICLE EMISSIONS RESULTS - DISABLED EGR
                                         PROJECT 11-4771-001

TEST NO.   123-31   RUN   1              VEHICLE NO.   12                 TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 CHEV. MALIBU          DATE    8/10/78                  ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                BAG CART NO.  1                  GASOLINE   EM-399
TRANSMISSION A3                          DYNO NO.      3                  ODOMETER   8085 KM(  5024 MILES)
GVW  2040 KG(  4498 LBS)                 CVS NO.       2

BAROMETER 741.68 MM HG(29.20 IN HG)      DRY BULB TEMP. 21.1 DEG C(70.0 DEG F)
RELATIVE HUMIDITY 68 PCT                 ABS. HUMIDITY 10.9 GM/KG
BAG RESULTS                                                               NOX HUMIDITY CORRECTION FACTOR  1.01
  BAG NUMBER                                  1                  2                  3                  4
  DESCRIPTION                          COLD TRANSIENT       STABILIZED        HOT TRANSIENT        STABILIZED

  BLOWER DIF P MM. H2O(IN. H2O)         799.3 (29.5)       799.3 (29.5)       799.3 (29.5)       799.3 (29.5)
  BLOWER INLET P MM. H2O(IN. H2O)       799.3 (29.5)       799.3 (29.5)       799.3 (29.5)       799.3 (29.5)
  BLOWER INLET TEMP. DEG. C(DEG. F)      44.4 (112.0)       43.3 (110.0)       43.9 (111.0)       43.3 (110.0)
  BLOWER REVOLUTIONS                        40699              69537              40576              69530
  CVS FLOW STD. CU. METRES(SCF)         76.3 (2694.6)     130.6 (4612.6)      76.1 (2689.1)     130.6 (4612.1)
  HC  SAMPLE METER/RANGE/PPM           17.3/ 3/  173      15.5/ 2/   15      33.2/ 2/   33      19.9/ 2/   19
  HC  BCKGRD METER/RANGE/PPM            1.1/ 3/   11      11.8/ 2/   12      11.6/ 2/   12      11.3/ 2/   11
  CO  SAMPLE METER/RANGE/PPM           65.9/ 3/ 1675      36.1/13/   32      63.2/11/  258      18.9/13/   18
  CO  BCKGRD METER/RANGE/PPM            1.0/ 3/   23      12.8/13/   12       2.7/11/    8       6.3/13/    6
  CO2 SAMPLE METER/RANGE/PCT           73.5/ 3/ 1.34      49.9/ 3/  .87      63.8/ 3/ 1.19      48.0/ 3/  .83
  CO2 BCKGRD METER/RANGE/PCT            4.1/ 3/  .06       3.8/ 3/  .06       4.2/ 3/  .06       4.0/ 3/  .06
  NOX SAMPLE METER/RANGE/PPM           45.3/ 2/   45      26.8/ 2/   27      45.7/ 2/   46      30.2/ 2/   30
  NOX BCKGRD METER/RANGE/PPM            1.5/ 2/    2       1.5/ 2/    2       1.5/ 2/    2       1.3/ 2/    1
  DILUTION FACTOR                           8.86              15.41              11.48              16.11

  HC  CONCENTRATION PPM                     163                  4                 23                  4
  CO  CONCENTRATION PPM                    1576                 20                239                 11
  CO2 CONCENTRATION PCT                    1.28                .81               1.08                .77
  NOX CONCENTRATION PPM                    44.0               25.4               44.3               29.0
  HC  MASS GRAMS                           7.18                .39                .99                .29
  CO  MASS GRAMS                         140.01               2.98              21.22               1.73
  CO2 MASS GRAMS                         1788.1             1936.9             1505.8             1894.0
  NOX MASS GRAMS                           6.46               6.39               6.50               7.29

  HC  GRAMS/KM                             1.25                .06                .17                .05
  CO  GRAMS/KM                            24.31                .49               3.69                .28
  CO2 GRAMS/KM                            310.9              318.1              261.9              308.8
  NOX GRAMS/KM                             1.12               1.05               1.13               1.19
  FUEL CONSUMPTION BY CB L/100KM          14.05              13.62              11.45              12.86

  RUN TIME               SECONDS            505                866                505                866
  AVG. EXH. OXYGEN       PERCENT           1.69               2.48               2.11               2.68
  CATALYST AVG. TEMP.    DEG. C             203                440                378                447
  CATALYST MAX. TEMP.    DEG. C             436                478                487                491
  MEASURED DISTANCE      KM                5.76               6.09               5.75               6.13
       DFC, WET (DRY)                               .917 ( .903)                          .929 ( .914)
       SCF, WET (DRY)                              1.000 ( .975)                         1.000 ( .976)
       VOL (SCM)                                         206.9                                 206.7
       KM  (MEASURED)                                    11.85                                 11.88

COMPOSITE RESULTS
  TEST NUMBER              123-31     TOTAL FUEL SULFUR    MG/KM   20.54                                  3-BAG        (4-BAG)
  BAROMETER      MM HG     741.7      AVG. EXH. OXYGEN     PCT      2.28     CARBON DIOXIDE      G/KM     301.0       ( 295.9)
  HUMIDITY       G/KG       10.9      CATALYST AVG. TEMP. DEG C      389     FUEL CONSUMPTION    L/100KM   13.32       ( 13.10)
  TEMPERATURE    DEG C      21.1      CATALYST MAX. TEMP. DEG C      487     HYDROCARBONS (THC)  G/KM        .39       (   .33)
                                                                             CARBON MONOXIDE     G/KM       6.35       (  6.29)
                                                                             OXIDES OF NITROGEN  G/KM       1.09       (  1.13)


                       PVM - 123   SET   VEHICLE EMISSIONS RESULTS - DISABLED EGR
                                         PROJECT 11-4771-001

VEHICLE MODEL   78 CHEV. MALIBU          VEHICLE NO.     12               TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 5.0 L(305 CID) V-8                TRANSMISSION A3                  ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
                                         GVW  2040 KG(  4498 LBS)         GASOLINE   EM-399

  TEST NUMBER                              123-32                 123-33
  TEST CYCLE                                SET                    HFET
  RUN NUMBER                                 1                      1
  DATE                                    8/10/78                8/10/78                      / /
  ODOMETER                          8119KM(  5045MILES)    8151KM(  5065MILES)
  CVS - BAG CART - DYNAMOMETER            2 - 1 - 3              2 - 1 - 3

  TEMPERATURE DEG. C (DEG. F)            22.8 / 73.0            25.0 / 77.0
  RELATIVE HUMIDITY, PCT                    50.1                   42.9
  BAROMETER, MM HG(IN HG)               741.7 (29.20)          741.7 (29.20)
  RUN TIME, SECONDS                         1397                    766

  BLOWER DIF P MM. H2O(IN. H2O)          799.3 (29.5)           799.3 (29.5)
  BLOWER INLET P MM. H2O(IN. H2O)        799.3 (29.5)           799.3 (29.5)
  BLOWER INLET TEMP. DEG. C(DEG. F)       42.8 (109.0)           42.8 (109.0)
  BLOWER REVOLUTIONS                       112176                  61517
  CVS FLOW STD. CU. METRES(SCF)         210.9 (7448.2)         115.6 (4084.7)
  HC  SAMPLE METER/RANGE/PPM            22.9/ 2/   22          21.2/ 2/   21
  HC  BCKGRD METER/RANGE/PPM            10.8/ 2/   11          10.9/ 2/   11
  CO  SAMPLE METER/RANGE/PPM            87.3/12/  207          72.1/12/  169
  CO  BCKGRD METER/RANGE/PPM             2.9/12/    4           2.0/12/    3
  CO2 SAMPLE METER/RANGE/PCT            75.9/ 3/ 1.38          91.3/ 3/ 1.71
  CO2 BCKGRD METER/RANGE/PCT             4.5/ 3/  .07           3.7/ 3/  .06
  NOX SAMPLE METER/RANGE/PPM            80.9/ 2/   80          41.0/ 3/  123
  NOX BCKGRD METER/RANGE/PPM              .6/ 2/    1            .6/ 3/    2
  HC  CONCENTRATION PPM                      13                     12
  CO  CONCENTRATION PPM                     199                    153
  CO2 CONCENTRATION PCT                     1.32                   1.66
  NOX CONCENTRATION PPM                     79.9                  121.9
  HC  MASS GRAMS                            1.55                    .78
  CO  MASS GRAMS                           47.72                  20.61
  CO2 MASS GRAMS                          5109.6                 3507.9
  NOX MASS GRAMS                           30.36                  25.08
       DFC, WET (DRY)                   .895 ( .886)           .871 ( .865)
       SCF, WET (DRY)                  1.000 ( .977)          1.000 ( .977)
       VOL (SCM)                           210.9                  115.6
       KM  (MEASURED)                      21.63                  16.29

  TEST NUMBER,          PVMT               123-32                 123-33
  BAROMETER,            MM HG              741.7                  741.7
  HUMIDITY,             G/KG                 8.9                    8.6
  TEMPERATURE,          DEG C               22.8                   25.0
  TOTAL FUEL SULFUR,    MG/KM              21.95                  19.89

  AVG. EXH. OXYGEN,     PCT                 1.80                   1.15
  CATALYST AVG. TEMP.,  DEG C                503                    566
  CATALYST MAX. TEMP.,  DEG C                606                    623
  CARBON DIOXIDE,       G/KM               236.3                  215.3
  FUEL CONSUMPTION,     L/100KM            10.29                   9.28

  HYDROCARBONS,         G/KM                 .07                    .05
  CARBON MONOXIDE,      G/KM                2.21                   1.27
  OXIDES OF NITROGEN,   G/KM                1.40                   1.54
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TABLE E-22. TEST 124 EMISSIONS RESULTS

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                      PVM - 124   FTP  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                       PROJECT 11-4771-001

TEST NO.   124-11   RUN   1
VEHICLE MODEL   78 CHEV. MALIBU          VEHICLE NO.   12                    TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 5.0 L(305 CID) V-8                DATE    8/30/78                     ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
TRANSMISSION A3                          BAG CART NO.  1                     GASOLINE  EM-349
GVW  2040 KG(  4498 LBS)                 DYNO NO.      3                     ODOMETER   9770 KM(  6071 MILES)
                                         CVS NO.       2
BAROMETER 741.17 MM HG(29.18 IN HG)
RELATIVE HUMIDITY 69 PCT                 DRY BULB TEMP. 21.7 DEG C(71.0 DEG F)
BAG RESULTS                              ABS. HUMIDITY 11.9 GM/KG            NOX HUMIDITY CORRECTION FACTOR  1.02
  BAG NUMBER                                   1                 2                  3                 4
  DESCRIPTION                           COLD TRANSIENT      STABILIZED       HOT TRANSIENT       STABILIZED

  BLOWER DIF P MM. H2O(IN. H2O)         762.0 (30.0)       762.0 (30.0)      762.0 (30.0)       762.0 (30.0)
  BLOWER INLET P MM. H2O(IN. H2O)       762.0 (30.0)       762.0 (30.0)      762.0 (30.0)       762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)      43.3 (110.0)       43.3 (110.0)      43.3 (110.0)       43.3 (110.0)
  BLOWER REVOLUTIONS                       40732              69715             40679              69658
  CVS FLOW STD. CU. METRES(SCF)         76.3 (2695.4)     130.6 (4612.0)     76.2 (2691.0)     130.5 (4608.9)
  HC  SAMPLE METER/RANGE/PPM           19.5/ 3/  195      12.4/ 2/   12     19.6/ 2/   20      9.7/ 2/   10
  HC  BCKGRD METER/RANGE/PPM            1.1/ 3/   11       9.7/ 2/   10      7.9/ 2/    8      7.6/ 2/    8
  CO  SAMPLE METER/RANGE/PPM           52.0/ 3/ 1301      11.3/13/   11     63.0/13/   51      6.0/13/    5
  CO  BCKGRD METER/RANGE/PPM             .6/ 3/   14       4.2/13/    4      1.7/13/    2      1.7/13/    2
  CO2 SAMPLE METER/RANGE/PCT           72.4/ 3/ 1.31      49.3/ 3/  .85     69.2/ 3/ 1.15     47.3/ 3/  .82
  CO2 BCKGRD METER/RANGE/PCT            3.4/ 3/  .05       3.5/ 3/  .05      3.8/ 3/  .06      3.4/ 3/  .06
  NOX SAMPLE METER/RANGE/PPM           37.7/ 2/   38      14.3/ 2/   14     35.5/ 2/   35     16.2/ 2/   16
  NOX BCKGRD METER/RANGE/PPM             .3/ 2/    0        .1/ 2/    0      1.0/ 2/    1       .5/ 2/    1
  DILUTION FACTOR                           9.23              15.66             11.61              16.91

  HC  CONCENTRATION PPM                      135                  3                12                  3
  CO  CONCENTRATION PPM                     1228                  7                47                  3
  CO2 CONCENTRATION PCT                     1.27                .80              1.09                .76
  NOX CONCENTRATION PPM                     37.4               14.2              34.6               15.7
  HC  MASS GRAMS                            5.99                .25               .59                .20
  CO  MASS GRAMS                          109.13               1.01              4.17                .95
  CO2 MASS GRAMS                          1770.3             1921.6            1526.3             1819.1
  NOX MASS GRAMS                            5.59               3.63              5.16               4.01

  HC  GRAMS/KM                              1.04                .04               .09                .03
  CO  GRAMS/KM                             19.05                .16               .73                .07
  CO2 GRAMS/KM                             309.0              312.7             266.2              299.8
  NOX GRAMS/KM                               .98                .59               .90                .66
  FUEL CONSUMPTION BY CB L/100KM           19.61              13.36             11.92              12.89

  RUN TIME               SECONDS             505                867               505                867
  AVG. EXH. OXYGEN       PERCENT            1.29               1.98              2.10               2.43
  CATALYST AVG. TEMP.    DEG. C              212                439               364                446
  CATALYST MAX. TEMP.    DEG. C              442                478               441                495
  MEASURED DISTANCE      KM                 5.73               6.15              5.73               6.15
       DFC, WET (DRY)                            .920 ( .905)                         .930 ( .915)
       SCF, WET (DRY)                           1.000 ( .975)                        1.000 ( .976)
       VOL (SCM)                                       206.9                                206.7
       KM  (MEASURED)                                  11.88                                11.89
COMPOSITE RESULTS
  TEST NUMBER            124-11                                                                 3-BAG       (4-BAG)
  BAROMETER      MM HG   741.2   TOTAL FUEL SULFUR   MG/KM   28.05  CARBON DIOXIDE      G/KM     299.1     ( 293.9)
  HUMIDITY       G/KG     11.9   AVG. EXH. OXYGEN    PCT      1.90  FUEL CONSUMPTION    L/100KM  13.09     ( 12.86)
  TEMPERATURE    DEG C    21.7   CATALYST AVG. TEMP. DEG C     388  HYDROCARBONS (THC)  G/KM       .26     (   .26)
                                 CATALYST MAX. TEMP. DEG C     491  CARBON MONOXIDE     G/KM      4.29     (  4.21)
                                                                    OXIDES OF NITROGEN  G/KM       .76     (   .77)


                      PVM - 124   SET  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                       PROJECT 11-4771-001

VEHICLE MODEL   78 CHEV. MALIBU          VEHICLE NO.     12                  TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 5.0 L(305 CID) V-8                TRANSMISSION A3                     ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
                                         GVW  2040 KG(  4498 LBS)            GASOLINE  EM-349
  TEST NUMBER                              124-12                 124-13
  TEST CYCLE                                 SET                   HFET
  RUN NUMBER                                  1                      1
  DATE                                     8/30/78                8/30/78
  ODOMETER                           9799KM(  6089MILES)    9836KM(  6112MILES)                      / /
  CVS - BAG CART - DYNAMOMETER              2 - 1 - 3              2 - 1 - 3

  TEMPERATURE DEG. C (DEG. F)             22.8 / 73.0            23.9 / 75.0
  RELATIVE HUMIDITY, PCT                     53.0                   47.0
  BAROMETER, MM HG(IN HG)               742.9 (29.25)          742.9 (29.25)
  RUN TIME, SECONDS                          1397                    765

  BLOWER DIF P MM. H2O(IN. H2O)         762.0 (30.0)           762.0 (30.0)
  BLOWER INLET P MM. H2O(IN. H2O)       762.0 (30.0)           762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)      43.3 (110.0)           43.3 (110.0)
  BLOWER REVOLUTIONS                       112970                  61669
  CVS FLOW STD. CU. METRES(SCF)        211.1 (7456.1)         115.7 (4088.1)
  HC  SAMPLE METER/RANGE/PPM            15.8/ 2/   16          12.3/ 2/   12
  HC  BCKGRD METER/RANGE/PPM             8.8/ 2/    9           8.4/ 2/    8
  CO  SAMPLE METER/RANGE/PPM            89.8/13/   63          38.8/13/   34
  CO  BCKGRD METER/RANGE/PPM             2.0/13/    2           2.2/13/    2
  CO2 SAMPLE METER/RANGE/PCT            77.0/ 3/ 1.41          92.5/ 3/ 1.73
  CO2 BCKGRD METER/RANGE/PCT             4.4/ 3/  .07           4.1/ 3/  .06
  NOX SAMPLE METER/RANGE/PPM            49.3/ 2/   49          75.0/ 2/   75
  NOX BCKGRD METER/RANGE/PPM              .4/ 2/    0           1.0/ 2/    1
  HC  CONCENTRATION PPM                        8                      5
  CO  CONCENTRATION PPM                       58                     31
  CO2 CONCENTRATION PCT                     1.35                   1.68
  NOX CONCENTRATION PPM                     48.9                   74.1
  HC  MASS GRAMS                             .97                    .33
  CO  MASS GRAMS                           19.27                   4.12
  CO2 MASS GRAMS                          4208.2                 3582.4
  NOX MASS GRAMS                           19.01                  15.55
       DFC, WET (DRY)                   .844 ( .885)           .871 ( .863)
       SCF, WET (DRY)                  1.000 ( .976)          1.000 ( .975)
       VOL (SCM)                           211.1                  115.7
       KM  (MEASURED)                      21.90                  16.39

  TEST NUMBER,             PVMT            124-12                 124-13
  BAROMETER,               MM HG            742.9                  742.9
  HUMIDITY,                G/KG               9.4                    9.0
  TEMPERATURE,             DEG C             22.8                   23.9
  TOTAL FUEL SULFUR,       MG/KM            21.86                  19.99

  AVG. EXH. OXYGEN,        PCT               1.71                   1.36
  CATALYST AVG. TEMP.,     DEG C              441                    484
  CATALYST MAX. TEMP.,     DEG C              606                    617
  CARBON DIOXIDE,          G/KM             237.0                  217.5
  FUEL CONSUMPTION,        L/100KM          10.20                   9.30

  HYDROCARBONS,            G/KM               .06                    .02
  CARBON MONOXIDE,         G/KM               .45                    .25
  OXIDES OF NITROGEN,      G/KM               .87                    .95
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TABLE E-23. TEST 124 EMISSIONS RESULTS

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                     PVM - 124   FTP   VEHICLE EMISSIONS RESULTS - HIGH OIL CONSUMPTION
                                       PROJECT 11-4771-001

TEST NO.   124-21   RUN   1                VEHICLE NO.   12               TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 CHEV. MALIBU            DATE    9/13/78                ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                  BAG CART NO.  1                GASOLINE  EM-399
TRANSMISSION A3                            DYNO NO.      3                ODOMETER  10190 KM(  6332 MILES)
GVW  2040 KG(  4498 LBS)                   CVS NO.       2

BAROMETER 736.35 MM HG(28.99 IN HG)        DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)
RELATIVE HUMIDITY 69 PCT                   ABS. HUMIDITY 11.9 GM/KG       NOX HUMIDITY CORRECTION FACTOR  1.04
BAG RESULTS
   BAG NUMBER                                      1                  2                  3                  4
   DESCRIPTION                             COLD TRANSIENT        STABILIZED       HOT TRANSIENT        STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)           749.3 (29.5)       749.3 (29.5)       749.3 (29.5)       749.3 (29.5)
   BLOWER INLET P MM. H2O(IN. H2O)         749.3 (29.5)       749.3 (29.5)       749.3 (29.5)       749.3 (29.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)        43.3 (110.0)       43.3 (110.0)       43.3 (110.0)       43.3 (110.0)
   BLOWER REVOLUTIONS                          40751              69596              40687              69666
   CVS FLOW STD. CU. METRES(SCF)           75.9 (2682.2)     129.7 (4580.4)      75.8 (2678.1)     129.8 (4584.7)
   HC  SAMPLE METER/RANGE/PPM             20.1/ 3/  201      33.7/ 2/   34      72.5/ 2/   73      23.6/ 2/   24
   HC  BCKGRD METER/RANGE/PPM              1.6/ 3/   16      13.8/ 2/   13      15.5/ 2/   15      13.4/ 2/   14
   CO  SAMPLE METER/RANGE/PPM             79.6/ 3/ 1974      93.7/12/  229      26.9/ 3/  625      57.6/12/  128
   CO  BCKGRD METER/RANGE/PPM              1.5/ 3/   39      19.3/12/   38       2.1/ 3/   47      25.4/12/   52
   CO2 SAMPLE METER/RANGE/PCT             76.6/ 3/ 1.40      53.1/ 3/  .93      69.0/ 3/ 1.24      50.6/ 3/  .88
   CO2 BCKGRD METER/RANGE/PCT              5.0/ 3/  .08       4.7/ 3/  .07       5.5/ 3/  .08       5.4/ 3/  .08
   NOX SAMPLE METER/RANGE/PPM             37.0/ 2/   37      10.4/ 2/   10      27.4/ 2/   27      13.9/ 2/   14
   NOX BCKGRD METER/RANGE/PPM              1.0/ 2/    1        .9/ 2/    1       1.2/ 2/    1       1.4/ 2/    1
   DILUTION FACTOR                             8.39              14.07              10.28              15.80

   HC  CONCENTRATION PPM                        187                 21                 59                 11
   CO  CONCENTRATION PPM                       1897                185                555                 76
   CO2 CONCENTRATION PCT                       1.33                .86               1.17                .80
   NOX CONCENTRATION PPM                       36.1                9.6               26.3               12.6
   HC  MASS GRAMS                              8.19               1.60               2.56                .80
   CO  MASS GRAMS                            163.37              27.97              48.96              11.48
   CO2 MASS GRAMS                            1852.0             2042.5             1621.0             1904.2
   NOX MASS GRAMS                              5.47               2.47               3.98               3.26

   HC  GRAMS/KM                                1.42                .26                .44                .13
   CO  GRAMS/KM                               28.29               4.56               8.49               1.87
   CO2 GRAMS/KM                               320.7              332.7              280.9              310.6
   NOX GRAMS/KM                                 .95                .40                .69                .53
   FUEL CONSUMPTION BY CB L/100KM             15.78              14.54              12.62              13.40

   RUN TIME                  SECONDS            506                865                504                867
   AVG. EXH. OXYGEN          PERCENT           1.19               1.42               1.31               1.53
   CATALYST AVG. TEMP.       DEG. C             288                435                367                448
   CATALYST MAX. TEMP.       DEG. C             418                466                474                482
   MEASURED DISTANCE         KM                5.77               6.14               5.77               6.13
         DFC, WET (DRY)                                .911 ( .896)                          .922 ( .907)
         SCF, WET (DRY)                               1.000 ( .979)                         1.000 ( .975)
         VOL (SCM)                                            205.6                                 205.6
         KM  (MEASURED)                                       11.91                                 11.90

COMPOSITE RESULTS                                                                                   3-BAG        (4-BAG)
   TEST NUMBER          124-21         TOTAL FUEL SULFUR   MG/KM   30.58     CARBON DIOXIDE      G/KM       315.9      ( 309.9)
   BAROMETER    MM HG   736.3          AVG. EXH. OXYGEN    PCT      1.36     FUEL CONSUMPTION    L/100KM    14.27      ( 13.93)
   HUMIDITY     G/KG     11.9          CATALYST AVG. TEMP. DEG C     388     HYDROCARBONS (THC)  G/KM         .55      (   .51)
   TEMPERATURE  DEG C    22.2          CATALYST MAX. TEMP. DEG C     474     CARBON MONOXIDE     G/KM       10.59      (  9.80)
                                                                             OXIDES OF NITROGEN  G/KM         .68      (   .63)


                     PVM - 124   SET   VEHICLE EMISSIONS RESULTS - HIGH OIL CONSUMPTION
                                       PROJECT 11-4771-001

                                           VEHICLE NO.     12               TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 CHEV. MALIBU            TRANSMISSION A3                  ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                  GVW  2040 KG(  4498 LBS)         GASOLINE  EM-399

   TEST NUMBER                                  124-22                124-23
   TEST CYCLE                                    SET                   HFET
   RUN NUMBER                                     1                     1
   DATE                                        9/13/78               9/13/78                  / /
   ODOMETER                              10219KM(  6350MILES)  10255KM(  6372MILES)
   CVS - BAG CART - DYNAMOMETER               2 - 1 - 3             2 - 1 - 3

   TEMPERATURE DEG. C (DEG. F)               22.2 / 72.0           24.4 / 76.0
   RELATIVE HUMIDITY, PCT                       53.3                  45.1
   BAROMETER, MM HG(IN HG)                  737.1 (29.02)         737.1 (29.02)
   RUN TIME, SECONDS                            1397                   765

   BLOWER DIF P MM. H2O(IN. H2O)            749.3 (29.5)          749.3 (29.5)
   BLOWER INLET P MM. H2O(IN. H2O)          749.3 (29.5)          749.3 (29.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)         43.3 (110.0)          43.3 (110.0)
   BLOWER REVOLUTIONS                          112432                 61600
   CVS FLOW STD. CU. METRES(SCF)           209.7 (7408.2)        114.9 (4059.1)
   HC  SAMPLE METER/RANGE/PPM              48.2/ 2/   48         30.7/ 2/   31
   HC  BCKGRD METER/RANGE/PPM              19.2/ 2/   19         19.0/ 2/   19
   CO  SAMPLE METER/RANGE/PPM              96.0/11/  500         95.0/12/  239
   CO  BCKGRD METER/RANGE/PPM               6.9/11/   21          6.1/12/   11
   CO2 SAMPLE METER/RANGE/PCT              79.9/ 3/ 1.46         95.0/ 3/ 1.78
   CO2 BCKGRD METER/RANGE/PCT               5.1/ 3/  .08          4.7/ 3/  .07
   NOX SAMPLE METER/RANGE/PPM              44.7/ 2/   45         79.0/ 2/   79
   NOX BCKGRD METER/RANGE/PPM               2.3/ 2/    2          1.4/ 2/    2
   HC  CONCENTRATION PPM                         36                    19
   CO  CONCENTRATION PPM                        458                   214
   CO2 CONCENTRATION PCT                       1.39                  1.72
   NOX CONCENTRATION PPM                       42.7                  77.4
   HC  MASS GRAMS                              4.31                  1.23
   CO  MASS GRAMS                            111.93                 28.57
   CO2 MASS GRAMS                            5329.4                3621.9
   NOX MASS GRAMS                             16.29                 15.00
         DFC, WET (DRY)                    .887 ( .870)          .865 ( .850)
         SCF, WET (DRY)                   1.000 ( .976)         1.000 ( .975)
         VOL (SCM)                                209.7                 114.9
         KM  (MEASURED)                           21.50                 16.14

   TEST NUMBER,          PVMT                 124-22                124-23
   BAROMETER,            MM HG                737.1                 737.1
   HUMIDITY,             G/KG                   9.2                   8.9
   TEMPERATURE,          DEG C                 22.2                  24.4
   TOTAL FUEL SULFUR,    MG/KM                 23.98                 20.80

   AVG. EXH. OXYGEN,     PCT                   1.01                   .71
   CATALYST AVG. TEMP.,  DEG C                  444                   558
   CATALYST MAX. TEMP.,  DEG C                  504                   606
   CARBON DIOXIDE,       G/KM                 247.9                 224.3
   FUEL CONSUMPTION,     L/100KM              10.96                  9.70

   HYDROCARBONS,         G/KM                   .20                   .08
   CARBON MONOXIDE,      G/KM                  5.21                  1.77
   OXIDES OF NITROGEN,   G/KM                   .76                   .93
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TABLE E-24. TEST 124 EMISSIONS RESULTS

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                    PVM - 124   FTP  VEHICLE EMISSIONS RESULTS - HIGH OIL CONSUMPTION
                                     PROJECT 11-4771-001

TEST NO.   124-31   RUN   1
VEHICLE MODEL    78 CHEV. MALIBU             VEHICLE NO.   12                   TEST WEIGHT    1588 KG(  3500 LBS)
ENGINE 5.0 L(305 CID) V-8                    DATE     9/14/78                   ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
TRANSMISSION A3                              BAG CART NO.  1                    GASOLINE  EM-344
GVW  2040 KG(  4498 LBS)                     DYNO NO.      3                    ODOMETER   10240 KM(  6394 MILES)
                                             CVS NO.       2

BAROMETER 739.90 MM HG(29.13 IN HG)          DRY BULB TEMP. 22.8 DEG C(73.0 DEG F)
RELATIVE HUMIDITY 61 PCT                     ABS. HUMIDITY 10.9 GM/KG           NOX HUMIDITY CORRECTION FACTOR  1.01
BAG RESULTS
  BAG NUMBER                                       1                 2                   3                 4
  DESCRIPTION                               COLD TRANSIENT      STABILIZED        HOT TRANSIENT       STABILIZED

  BLOWER DIF P MM. H2O(IN. H2O)              749.3 (29.5)      762.0 (30.0)       762.0 (30.0)      762.0 (30.0)
  BLOWER INLET P MM. H2O(IN. H2O)            749.3 (29.5)      762.0 (30.0)       762.0 (30.0)      762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)           43.3 (110.0)      43.3 (110.0)       43.3 (110.0)      43.3 (110.0)
  BLOWER REVOLUTIONS                            70805              64522              40621             64785
  CVS FLOW STD. CU. METRES(SCF)              76.5 (2700.3)     130.0 (4590.8)     76.0 (2682.7)     130.9 (4620.6)
  HC  SAMPLE METER/RANGE/PPM                19.0/ 3/  190      95.7/ 2/   96      65.1/ 2/   65     25.3/ 2/   25
  HC  BCKGRD METER/RANGE/PPM                 1.5/ 3/   15      15.0/ 2/   15      19.2/ 2/   19     13.5/ 2/   13
  CO  SAMPLE METER/RANGE/PPM                71.8/ 3/ 1880      68.6/11/  290      99.1/11/  491     59.3/12/  120
  CO  BCKGRD METER/RANGE/PPM                  .7/ 3/   16     4.4/11/   15       3.3/11/   10      4.5/12/    8
  CO2 SAMPLE METER/RANGE/PCT                78.5/ 3/ 1.32      49.6/ 3/  .86      67.3/ 3/ 1.21     48.4/ 3/  .89
  CO2 BCKGRD METER/RANGE/PCT                 4.4/ 3/  .07       4.0/ 3/  .06       4.1/ 3/  .06      4.6/ 3/  .07
  NOX SAMPLE METER/RANGE/PPM                38.7/ 2/   36       4.5/ 2/   10      88.4/ 2/   85     11.1/ 2/   11
  NOX BCKGRD METER/RANGE/PPM                 1.8/ 2/    1        .8/ 2/    1        .7/ 2/    1       .8/ 2/    1
  DILUTION FACTOR                               8.85              15.08              10.61             15.76

  HC  CONCENTRATION PPM                          177                 32                  52                13
  CO  CONCENTRATION PPM                         1782                266                 461               109
  CO2 CONCENTRATION PCT                         1.26                .80                1.15               .77
  NOX CONCENTRATION PPM                         34.8                8.8                84.8              10.4
  HC  MASS GRAMS                                7.79               2.38                2.29               .95
  CO  MASS GRAMS                              158.63              40.19               40.76             16.51
  CO2 MASS GRAMS                              1757.5             1909.3              1602.4            1838.6
  NOX MASS GRAMS                                5.13               2.19                3.68              2.60

  HC  GRAMS/KM                                  1.36                .38                 .40               .15
  CO  GRAMS/KM                                 27.63               6.49                7.08              2.66
  CO2 GRAMS/KM                                 306.1              308.2               278.4             296.5
  NOX GRAMS/KM                                   .89                .35                 .63               .42
  FUEL CONSUMPTION BY CB L/100KM               15.10              13.69               12.91             12.85

  RUN TIME                    SECONDS            505                867                 505               868
  AVG. EXH. OXYGEN            PERCENT           1.19               1.32                1.44              1.80
  CATALYST AVG. TEMP.         DEG. C             203                432                 377               443
  CATALYST MAX. TEMP.         DEG. C             426                469                 477               487
  MEASURED DISTANCE           KM                5.74               6.20                5.76              6.20
      DFC, WET (DRY)                                   .916 ( .904)                            .905 ( .913)
      SCF, WET (DRY)                                  1.000 ( .977)                           1.000 ( .978)
      VOL (SCM)                                               206.4                                   206.3
      KM  (MEASURED)                                          11.94                                   11.96

COMPOSITE RESULTS
  TEST NUMBER             124-31      TOTAL FUEL SULFUR   MG/KM    29.16      CARBON DIOXIDE          G/KM      3-BAG       (4-BAG)
  BAROMETER      MM HG    739.9       AVG. EXH. OXYGEN    PCT       1.33      FUEL CONSUMPTION        L/100KM   299.6      ( 296.1)
  HUMIDITY       G/KG      10.9       CATALYST AVG. TEMP. DEG C      384      HYDROCARBONS (THC)      G/KM      13.61      ( 13.37)
  TEMPERATURE    DEG C     22.8       CATALYST MAX. TEMP. DEG C      477      CARBON MONOXIDE         G/KM        .59      (   .52)
                                                                            OXIDES OF NITROGEN      G/KM      11.02      (  9.89)
                                                                                                                .59      (   .56)
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                    PVM - 124   SET  VEHICLE EMISSIONS RESULTS - HIGH OIL CONSUMPTION
                                     PROJECT 11-4771-001

VEHICLE MODEL    78 CHEV. MALIBU             VEHICLE NO.     12                  TEST WEIGHT    1588 KG(  3500 LBS)
ENGINE 5.0 L(305 CID) V-8                    TRANSMISSION A3                     ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
                                             GVW  2040 KG(  4498 LBS)            GASOLINE  EM-344
  TEST NUMBER
  TEST CYCLE                                  124-32                 124-33
  RUN NUMBER                                   SET                    HFET
  DATE                                          1                      1
  ODOMETER                                   9/14/78                9/14/78
  CVS - BAG CART - DYNAMOMETER               0KM(     0MILES)       0KM(     0MILES)                 / /
                                             2 - 1 - 3              2 - 1 - 3
  TEMPERATURE DEG. C (DEG. F)
  RELATIVE HUMIDITY, PCT                     25.0 / 77.0            25.0 / 77.0
  BAROMETER, MM HG(IN HG)                       52.5                   44.1
  RUN TIME, SECONDS                          739.9 (29.13)          739.9 (29.11)
                                                1396                    765
  BLOWER DIF P MM. H2O(IN. H2O)
  BLOWER INLET P MM. H2O(IN. H2O)            762.0 (30.0)           762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)          762.0 (30.0)           762.0 (30.0)
  BLOWER REVOLUTIONS                          43.3 (110.0)           43.3 (110.0)
  CVS FLOW STD. CU. METRES(SCF)                118912                 61764
  HC  SAMPLE METER/RANGE/PPM                 210.2 (7424.2)         115.9 (4076.6)
  HC  BCKGRD METER/RANGE/PPM                 44.4/ 2/   44          35.7/ 2/   36
  CO  SAMPLE METER/RANGE/PPM                 13.8/ 2/   14          10.0/ 2/   10
  CO  BCKGRD METER/RANGE/PPM                 97.9/11/  518          87.8/11/  427
  CO2 SAMPLE METER/RANGE/PCT                  1.3/11/    4           1.8/11/    5
  CO2 BCKGRD METER/RANGE/PCT                 76.9/ 3/ 1.40          97.2/ 3/ 1.83
  NOX SAMPLE METER/RANGE/PPM                  3.8/ 3/  .06           3.7/ 3/  .06
  NOX BCKGRD METER/RANGE/PPM                 39.2/ 2/   39          65.0/ 2/   65
  HC  CONCENTRATION PPM                       1.8/ 2/    1           1.8/ 2/    2
  CO  CONCENTRATION PPM                          33                     27
  CO2 CONCENTRATION PCT                         498                    400
  NOX CONCENTRATION PPM                         1.34                   1.78
  HC  MASS GRAMS                                38.3                   63.5
  CO  MASS GRAMS                                4.50                   1.88
  CO2 MASS GRAMS                              120.41                  53.70
  NOX MASS GRAMS                              5171.0                 3764.0
      DFC, WET (DRY)                           15.38                  13.67
      SCF, WET (DRY)                         .892 ( .882)           .860 ( .852)
      VOL (SCM)                             1.000 ( .977)          1.000 ( .974)
      KM  (MEASURED)                           210.2                  115.9
                                               21.90                  16.30
  TEST NUMBER,            PVMT
  BAROMETER,              MM HG               124-32                 124-33
  HUMIDITY,               G/KG                739.9                  739.9
  TEMPERATURE,            DEG C                10.7                   10.0
  TOTAL FUEL SULFUR,      MG/KM                25.0                   25.0
                                               22.95                  21.63
  AVG. EXH. OXYGEN,       PCT
  CATALYST AVG. TEMP.,    DEG C                 1.17                    .63
  CATALYST MAX. TEMP.,    DEG C                  507                    572
  CARBON DIOXIDE,         G/KM                   444                    627
  FUEL CONSUMPTION,       L/100KM              236.2                  231.0
                                               10.90                  10.09
  HYDROCARBONS,           G/KM
  CARBON MONOXIDE,        G/KM                   .11                    .11
  OXIDES OF NITROGEN,     G/KM                  5.60                   3.30
                                                 .70                    .84
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TABLE E-25. TEST 131 EMISSIONS RESULTS

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                          PVM - 131   FTP  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                           PROJECT 11-4771-001

TEST NO.   131-11   RUN   1                VEHICLE NO.      13                 TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 CHEV MALIBU CAL         DATE     5/12/78                    ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                  BAG CART NO.  1                     GASOLINE  EM-344
TRANSMISSION A3                            DYNO NO.      3                     ODOMETER    1693 KM(  1052 MILES)
GVW  2052 KG(  4523 LBS)                   CVS NO.       2

BAROMETER 738.89 MM HG(29.09 IN HG)        DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)
RELATIVE HUMIDITY 71 PCT                   ABS. HUMIDITY 13.9 GM/KG            NOX HUMIDITY CORRECTION FACTOR  1.12
BAG RESULTS
   BAG NUMBER                                    1                  2                  3                  4
   DESCRIPTION                             COLD TRANSIENT      STABILIZED       HOT TRANSIENT       STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)           762.0 (30.0)       762.0 (30.0)       762.0 (30.0)       762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)         762.0 (30.0)       762.0 (30.0)       762.0 (30.0)       762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)        43.9 (111.0)       43.3 (110.0)       43.3 (110.0)       43.3 (110.0)
   BLOWER REVOLUTIONS                          42968              69272              40577              69581
   CVS FLOW STD. CU. METRES(SCF)            76.3 (2695.4)     129.2 (4563.0)      75.7 (2673.1)     129.7 (4581.2)
   HC  SAMPLE METER/RANGE/PPM              88.2/ 2/   88      18.7/ 2/   19      24.3/ 2/   24      18.5/ 2/   18
   HC  BCKGRD METER/RANGE/PPM              19.2/ 2/   19      12.9/ 2/   13      13.6/ 2/   14      12.9/ 2/   13
   CO  SAMPLE METER/RANGE/PPM              26.5/ 3/  616       7.7/13/    7      22.5/13/   21       6.6/13/    6
   CO  BCKGRD METER/RANGE/PPM                .3/ 3/    7       6.6/13/    6       4.5/13/    4       4.1/13/    4
   CO2 SAMPLE METER/RANGE/PCT              42.9/ 3/ 1.73      66.2/ 3/ 1.19      83.3/ 3/ 1.54      63.6/ 3/ 1.13
   CO2 BCKGRD METER/RANGE/PCT               3.9/ 3/  .06       4.3/ 3/  .07       4.3/ 3/  .07       4.5/ 3/  .07
   NOX SAMPLE METER/RANGE/PPM              20.4/ 2/   20      12.3/ 2/   12      18.4/ 2/   18      11.7/ 2/   12
   NOX BCKGRD METER/RANGE/PPM               1.4/ 2/    1       1.5/ 2/    2       1.3/ 2/    1       1.2/ 2/    1
   DILUTION FACTOR                              7.96              11.86               8.69              11.78

   HC  CONCENTRATION PPM                          73                  7                 12                  6
   CO  CONCENTRATION PPM                         575                  1                 16                  3
   CO2 CONCENTRATION PCT                        1.68               1.13               1.48               1.07
   NOX CONCENTRATION PPM                        19.2               10.9               17.2               10.6
   HC  MASS GRAMS                               3.21                .52                .54                .47
   CO  MASS GRAMS                              51.19                .21               1.45                .38
   CO2 MASS GRAMS                             2343.0             2666.3             2051.0             2546.9
   NOX MASS GRAMS                               3.13               3.00               2.79               2.94

   HC  GRAMS/KM                                  .56                .08                .09                .08
   CO  GRAMS/KM                                 8.86                .03                .25                .06
   CO2 GRAMS/KM                                406.0              433.6              354.8              413.9
   NOX GRAMS/KM                                  .54                .49                .48                .48
   FUEL CONSUMPTION BY CB L/100KM              18.00              18.58              15.17              17.60

   RUN TIME              SECONDS                 505                867                505                867
   AVG. EXH. OXYGEN      PERCENT                5.25               5.55               5.55               5.40
   CATALYST AVG. TEMP.   DEG. C                  398                553                433                547
   CATALYST MAX. TEMP.   DEG. C                  584                593                584                554
   MEASURED DISTANCE     KM                     5.77               6.15               5.78               6.15
        DFC, WET (DRY)                                .894 ( .880)                          .904 ( .884)
        SCF, WET (DRY)                               1.000 ( .971)                         1.000 ( .972)
        VOL (SCM)                                          205.5                                 205.4
        KM  (MEASURED)                                     11.92                                 11.93

COMPOSITE RESULTS                                                                                       3-BAG        (4-BAG)
   TEST NUMBER            131-11       TOTAL FUEL SULFUR   MG/KM   35.99     CARBON DIOXIDE     G/KM    406.1       ( 408.3)
   BAROMETER     MM HG    738.9        AVG. EXH. OXYGEN    PCT      5.50     FUEL CONSUMPTION   L/100KM  17.49       ( 17.29)
   HUMIDITY      G/KG      13.9        CATALYST AVG. TEMP. DEG C     445     HYDROCARBONS (THC) G/KM      .18       (   .18)
   TEMPERATURE   DEG C     24.4        CATALYST MAX. TEMP. DEG C     593     CARBON MONOXIDE    G/KM     1.93       (  1.99)
                                                                              OXIDES OF NITROGEN G/KM      .50       (   .50)
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                          PVM - 131   SET  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                           PROJECT 11-4771-001

                                           VEHICLE NO.      13                 TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 CHEV MALIBU CAL         TRANSMISSION A3                     ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                  GVW  2052 KG(  4523 LBS)            GASOLINE  EM-344

   TEST NUMBER                               131-12                 131-13
   TEST CYCLE                                 SET                    HFET
   RUN NUMBER                                  1                      1
   DATE                                     5/12/78                5/12/78                       / /
   ODOMETER                             1717KM(  1067MILES)    1738KM(  1080MILES)
   CVS - BAG CART - DYNAMOMETER              2 - 1 - 3              2 - 1 - 3

   TEMPERATURE DEG. C (DEG. F)             24.4 / 76.0            25.0 / 77.0
   RELATIVE HUMIDITY, PCT                     48.5                   49.1
   BAROMETER, MM HG(IN HG)                739.1 (29.10)          739.1 (29.10)
   RUN TIME, SECONDS                          1397                    765

   BLOWER DIF P MM. H2O(IN. H2O)          762.0 (30.0)           762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)        762.0 (30.0)           762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)       43.3 (110.0)           43.9 (111.0)
   BLOWER REVOLUTIONS                        118191                  61572
   CVS FLOW STD. CU. METRES(SCF)          209.2 (7389.5)         114.8 (4053.8)
   HC  SAMPLE METER/RANGE/PPM             28.9/ 2/   28          28.6/ 2/   29
   HC  BCKGRD METER/RANGE/PPM             20.3/ 2/   20          19.8/ 2/   20
   CO  SAMPLE METER/RANGE/PPM             73.7/12/  168          27.5/13/   26
   CO  BCKGRD METER/RANGE/PPM              1.8/12/    3           2.7/13/    3
   CO2 SAMPLE METER/RANGE/PCT             42.8/ 2/ 1.89          48.7/ 2/ 2.21
   CO2 BCKGRD METER/RANGE/PCT              1.9/ 2/  .07           1.6/ 2/  .06
   NOX SAMPLE METER/RANGE/PPM             22.3/ 2/   22          40.0/ 2/   40
   NOX BCKGRD METER/RANGE/PPM              2.1/ 2/    2           2.1/ 2/    2
   HC  CONCENTRATION PPM                       11                     12
   CO  CONCENTRATION PPM                      156                     22
   CO2 CONCENTRATION PCT                     1.83                   2.16
   NOX CONCENTRATION PPM                     20.5                   38.2
   HC  MASS GRAMS                            1.33                    .80
   CO  MASS GRAMS                           38.11                   2.99
   CO2 MASS GRAMS                          7003.4                 4541.8
   NOX MASS GRAMS                            7.89                   8.20
        DFC, WET (DRY)                 .850 ( .850)           .835 ( .827)
        SCF, WET (DRY)                1.000 ( .973)          1.000 ( .970)
        VOL (SCM)                           209.2                  114.8
        KM  (MEASURED)                      21.70                  16.45

   TEST NUMBER,          PVMT              131-12                 131-13
   BAROMETER,            MM HG              739.1                  739.1
   HUMIDITY,             G/KG                 9.5                   10.0
   TEMPERATURE,          DEG C               24.4                   25.0
   TOTAL FUEL SULFUR,    MG/KM              28.57                  29.26

   AVG. EXH. OXYGEN,     PCT                 4.45                   4.30
   CATALYST AVG. TEMP.,  DEG C                613                    547
   CATALYST MAX. TEMP.,  DEG C                691                    648
   CARBON DIOXIDE,       G/KM               322.8                  276.1
   FUEL CONSUMPTION,     L/100KM            13.48                  11.80

   HYDROCARBONS,         G/KM                 .06                    .05
   CARBON MONOXIDE,      G/KM                1.76                    .18
   OXIDES OF NITROGEN,   G/KM                 .36                    .50
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TABLE E-26. TEST 131 EMISSIONS RESULTS

PVM - 131 FTP VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
PROJECT 11-4771-001

TEST NO. 131-21 RUN 1
VEHICLE MODEL 78 CHEV MALIBU CAL
ENGINE 5.0 L(305 CID) V-8
TRANSMISSION A3
GVW 2052 KG(4523 LBS)

VEHICLE NO. 13
DATE 5/22/78
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2

TEST WEIGHT 1588 KG(3500 LBS)
ACTUAL ROAD LOAD 8.0 KW(10.7 HP)
GASOLINE EM-399
ODOMETER 2873 KM(1400 MILES)

BAROMETER 743.20 MM HG(29.26 IN HG)
RELATIVE HUMIDITY 52 PCT

DRY BULB TEMP. 24.9 DEG C(76.8 DEG F)
ABS. HUMIDITY 10.1 GM/KG

NOX HUMIDITY CORRECTION FACTOR .98

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	COLD TRANSIENT	STABILIZED	HOT TRANSIENT	STABILIZED
BLOWER DIF P MM. H2O(IN. H2O)	736.6 (29.0)	762.0 (30.0)	762.0 (30.0)	762.0 (30.0)
BLOWER INLET P MM. H2O(IN. H2O)	736.6 (29.0)	762.0 (30.0)	762.0 (30.0)	762.0 (30.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	44.4 (112.0)	43.9 (111.0)	44.4 (112.0)	43.9 (111.0)
BLOWER REVOLUTIONS	40708	69639	40685	69946
CVS FLOW STD. CU. METRES(SCF)	76.6 (2706.7)	130.7 (4616.7)	76.3 (2696.0)	130.5 (4607.7)
HC SAMPLE METER/RANGE/PPM	85.1/ 2/ 85	17.5/ 2/ 18	29.0/ 2/ 29	16.8/ 2/ 17
HC BCKGRD METER/RANGE/PPM	19.3/ 2/ 19	19.9/ 2/ 19	19.9/ 2/ 19	19.6/ 2/ 18
CO SAMPLE METER/RANGE/PPM	39.2/ 3/ 934	50.5/13/ 48	39.7/13/ 38	53.3/13/ 51
CO BCKGRD METER/RANGE/PPM	.8/ 3/ 18	10.2/13/ 10	9.7/13/ 5	3.3/13/ 3
CO2 SAMPLE METER/RANGE/PCT	42.0/ 3/ 1.72	71.6/ 3/ 1.30	89.9/ 3/ 1.67	70.0/ 3/ 1.26
CO2 BCKGRD METER/RANGE/PCT	9.8/ 3/ .06	9.7/ 3/ .07	9.5/ 3/ .07	9.9/ 3/ .07
NOX SAMPLE METER/RANGE/PPM	17.8/ 2/ 17	8.5/ 2/ 9	15.3/ 2/ 15	7.7/ 2/ 8
NOX BCKGRD METER/RANGE/PPM	1.3/ 2/ 1	1.0/ 2/ 1	.8/ 2/ 1	1.0/ 2/ 1
DILUTION FACTOR	7.37	10.28	8.02	10.59
HC CONCENTRATION PPM	73	5	11	4
CO CONCENTRATION PPM	872	37	38	46
CO2 CONCENTRATION PCT	1.66	1.23	1.61	1.20
NOX CONCENTRATION PPM	16.1	7.6	19.6	6.8
HC MASS GRAMS	3.22	.39	.50	.27
CO MASS GRAMS	77.79	5.69	2.83	6.98
CO2 MASS GRAMS	2335.9	2998.1	2292.9	2879.0
NOX MASS GRAMS	2.31	1.86	2.09	1.66
HC GRAMS/KM	.55	.06	.09	.09
CO GRAMS/KM	13.43	.93	.49	1.19
CO2 GRAMS/KM	403.2	479.9	388.9	460.6
NOX GRAMS/KM	.40	.30	.36	.27
FUEL CONSUMPTION BY CB L/100KM	18.19	20.55	16.69	20.08
RUN TIME SECONDS	505	867	506	866
AVG. EXH. OXYGEN PERCENT	4.60	2.75	3.95	2.40
CATALYST AVG. TEMP. DEG. C	373	674	568	674
CATALYST MAX. TEMP. DEG. C	682	726	687	738
MEASURED DISTANCE KM	5.79	6.19	5.77	6.13
DFC, WET (DRY)	.889 (.879)		.890 (.885)	
SCF, WET (DRY)	1.000 (.976)		1.000 (.977)	
VOL (SCM)	207.3		206.8	
KM (MEASURED)	11.99		11.90	

COMPOSITE RESULTS

TEST NUMBER		131-21
BAROMETER	MM HG	743.2
HUMIDITY	G/KG	10.1
TEMPERATURE	DEG C	24.9

TOTAL FUEL SULFUR	MG/KM	39.27
AVG. EXH. OXYGEN	PCT	3.30
CATALYST AVG. TEMP. DEG C		609
CATALYST MAX. TEMP. DEG C		726

		3-BAG	(4-BAG)
CARBON DIOXIDE	G/KM	438.8	(435.9)
FUEL CONSUMPTION	L/100KM	18.98	(18.89)
HYDROCARBONS (THC)	G/KM	.17	(.16)
CARBON MONOXIDE	G/KM	3.98	(3.90)
OXIDES OF NITROGEN	G/KM	.34	(.33)

PVM - 131 SET VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
PROJECT 11-4771-001

VEHICLE MODEL 78 CHEV MALIBU CAL
ENGINE 5.0 L(305 CID) V-8

VEHICLE NO. 13
TRANSMISSION A3
GVW 2052 KG(4523 LBS)

TEST WEIGHT 1588 KG(3500 LBS)
ACTUAL ROAD LOAD 8.0 KW(10.7 HP)
GASOLINE EM-399

TEST NUMBER	131-22	131-23	
TEST CYCLE	SET	HFET	
RUN NUMBER	1	1	
DATE	5/22/78	5/22/78	
ODOMETER	2103KM(1307MILES)	2129KM(1320MILES)	/ /
CVS - BAG CART - DYNAMOMETER	2 - 1 - 3	2 - 1 - 3	
TEMPERATURE DEG. C (DEG. F)	26.1 / 79.0	26.1 / 79.0	
RELATIVE HUMIDITY, PCT	43.7	43.7	
BAROMETER, MM HG(IN HG)	741.2 (29.18)	741.2 (29.18)	
RUN TIME, SECONDS	1397	765	
BLOWER DIF P MM. H2O(IN. H2O)	762.0 (30.0)	762.0 (30.0)	
BLOWER INLET P MM. H2O(IN. H2O)	762.0 (30.0)	762.0 (30.0)	
BLOWER INLET TEMP. DEG. C(DEG. F)	44.4 (112.0)	44.4 (112.0)	
BLOWER REVOLUTIONS	112881	61593	
CVS FLOW STD. CU. METRES(SCF)	209.8 (7410.7)	115.1 (4064.4)	
HC SAMPLE METER/RANGE/PPM	21.3/ 2/ 21	20.3/ 2/ 20	
HC BCKGRD METER/RANGE/PPM	20.2/ 2/ 20	19.1/ 2/ 19	
CO SAMPLE METER/RANGE/PPM	70.7/13/ 160	40.0/13/ 39	
CO BCKGRD METER/RANGE/PPM	.9/13/ 1	.9/13/ 1	
CO2 SAMPLE METER/RANGE/PCT	45.0/ 2/ 2.05	51.0/ 2/ 2.30	
CO2 BCKGRD METER/RANGE/PCT	1.9/ 2/ .07	1.8/ 2/ .07	
NOX SAMPLE METER/RANGE/PPM	18.5/ 2/ 18	36.7/ 2/ 37	
NOX BCKGRD METER/RANGE/PPM	.7/ 2/ 1	.9/ 2/ 1	
HC CONCENTRATION PPM	4	4	
CO CONCENTRATION PPM	151	36	
CO2 CONCENTRATION PCT	1.99	2.33	
NOX CONCENTRATION PPM	17.4	36.0	
HC MASS GRAMS	.51	.50	
CO MASS GRAMS	36.00	4.77	
CO2 MASS GRAMS	7698.3	4413.3	
NOX MASS GRAMS	6.90	7.60	
DFC, WET (DRY)	.896 (.839)	.888 (.816)	
SCF, WET (DRY)	1.000 (.973)	1.000 (.970)	
VOL (SCM)	209.8	115.1	
KM (MEASURED)	21.63	16.26	

TEST NUMBER,	PVMT	131-22	131-23
BAROMETER,	MM HG	741.2	741.2
HUMIDITY,	G/KG	9.5	9.6
TEMPERATURE,	DEG C	26.1	26.1
TOTAL FUEL SULFUR,	MG/KM	31.97	26.73
AVG. EXH. OXYGEN,	PCT	3.15	3.00
CATALYST AVG. TEMP.,	DEG C	700	637
CATALYST MAX. TEMP.,	DEG C	752	713
CARBON DIOXIDE,	G/KM	353.6	308.1
FUEL CONSUMPTION,	L/100KM	15.01	12.92
HYDROCARBONS,	G/KM	.02	.04
CARBON MONOXIDE,	G/KM	1.70	.29
OXIDES OF NITROGEN,	G/KM	.32	.47

TABLE E-27. TEST 131 EMISSIONS RESULTS

PVM - 131 FTP VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
PROJECT 11-4771-001

TEST NO. 131-31 RUN 1	VEHICLE NO. 13	TEST WEIGHT 1588 KG(3500 LBS)
VEHICLE MODEL 78 CHEV MALIBU CAL	DATE 5/24/78	ACTUAL ROAD LOAD 8.0 KW(10.7 HP)
ENGINE 5.0 L(305 CID) V-8	BAG CART NO. 1	GASOLINE EM-344
TRANSMISSION A3	DYNO NO. 3	ODOMETER 2155 KM(1339 MILES)
GVW 2052 KG(4523 LBS)	CVS NO. 2	

BAROMETER 739.39 MM HG(29.11 IN HG)
RELATIVE HUMIDITY 50 PCT
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)
ABS. HUMIDITY 10.4 GM/KG
NOX HUMIDITY CORRECTION FACTOR .99

BAG RESULTS

BAG NUMBER		1	2	3	4
DESCRIPTION		COLD TRANSIENT	STABILIZED	HOT TRANSIENT	STABILIZED
BLOWER DIF P MM. H2O(IN. H2O)		762.0 (30.0)	762.0 (30.0)	762.0 (30.0)	762.0 (30.0)
BLOWER INLET P MM. H2O(IN. H2O)		762.0 (30.0)	762.0 (30.0)	762.0 (30.0)	762.0 (30.0)
BLOWER INLET TEMP. DEG. C(DEG. F)		43.3 (110.0)	44.4 (112.0)	44.4 (112.0)	44.4 (112.0)
BLOWER REVOLUTIONS		40687	69543	40693	69541
CVS FLOW STD. CU. METRES(SCF)		76.0 (2685.2)	129.7 (4580.2)	75.9 (2680.1)	129.7 (4580.0)
HC SAMPLE METER/RANGE/PPM		90.8/ 2/ 91	16.2/ 2/ 16	29.3/ 2/ 29	18.8/ 2/ 19
HC BCKGRD METER/RANGE/PPM		14.5/ 2/ 14	14.3/ 2/ 14	16.6/ 2/ 17	16.1/ 2/ 16
CO SAMPLE METER/RANGE/PPM		91.2/ 3/ 986	26.1/13/ 25	54.4/13/ 52	54.6/12/ 120
CO BCKGRD METER/RANGE/PPM		.1/ 3/ 2	5.0/13/ 5	5.0/13/ 5	2.3/12/ 4
CO2 SAMPLE METER/RANGE/PCT		97.6/ 3/ 1.84	71.6/ 3/ 1.30	88.5/ 3/ 1.65	70.6/ 3/ 1.28
CO2 BCKGRD METER/RANGE/PCT		4.8/ 3/ .07	5.7/ 3/ .09	4.8/ 3/ .07	6.1/ 3/ .09
NOX SAMPLE METER/RANGE/PPM		18.7/ 2/ 19	8.6/ 2/ 9	15.3/ 2/ 15	7.6/ 2/ 8
NOX BCKGRD METER/RANGE/PPM		1.2/ 2/ 1	1.1/ 2/ 1	1.1/ 2/ 1	1.4/ 2/ 1
DILUTION FACTOR		6.91	10.30	8.10	10.86
HC CONCENTRATION PPM		78	3	15	4
CO CONCENTRATION PPM		933	19	45	111
CO2 CONCENTRATION PCT		1.77	1.22	1.58	1.20
NOX CONCENTRATION PPM		17.7	7.6	14.3	6.6
HC MASS GRAMS		3.44	.25	.65	.32
CO MASS GRAMS		82.61	2.93	4.01	16.80
CO2 MASS GRAMS		2471.0	2891.2	2198.7	2838.7
NOX MASS GRAMS		2.55	1.87	2.06	1.62
HC GRAMS/KM		.60	.04	.11	.05
CO GRAMS/KM		14.49	.48	.70	2.76
CO2 GRAMS/KM		433.4	474.8	385.5	466.0
NOX GRAMS/KM		.45	.31	.36	.27
FUEL CONSUMPTION BY CB L/100KM		19.55	20.30	16.52	20.68
RUN TIME	SECONDS	505	866	506	866
AVG. EXH. OXYGEN	PERCENT	4.75	2.75	2.50	2.25
CATALYST AVG. TEMP.	DEG. C	394	657	583	674
CATALYST MAX. TEMP.	DEG. C	646	713	602	734
MEASURED DISTANCE	KM	5.70	6.09	5.70	6.09
DFC, WET (DRY)		.885 (.877)		.894 (.886)	
SCF, WET (DRY)		1.000 (.977)		1.000 (.977)	
VOL (SCM)		205.7		205.6	
KM (MEASURED)		11.79		11.79	

COMPOSITE RESULTS

TEST NUMBER		131-31							3-BAG	(4-BAG)
BAROMETER	MM HG	739.4	TOTAL FUEL SULFUR	MG/KM	34.53	CARBON DIOXIDE	G/KM		441.6	(439.0)
HUMIDITY	G/KG	10.4	AVG. EXH. OXYGEN	PCT	3.25	FUEL CONSUMPTION	L/100KM		19.10	(19.09)
TEMPERATURE	DEG C	25.6	CATALYST AVG. TEMP.	DEG C	600	HYDROCARBONS (THC)	G/KM		.18	(.18)
			CATALYST MAX. TEMP.	DEG C	713	CARBON MONOXIDE	G/KM		3.46	(4.13)
						OXIDES OF NITROGEN	G/KM		.35	(.34)

PVM - 131 SET VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
PROJECT 11-4771-001

VEHICLE MODEL 78 CHEV MALIBU CAL	VEHICLE NO. 13	TEST WEIGHT 1588 KG(3500 LBS)
ENGINE 5.0 L(305 CID) V-8	TRANSMISSION A3	ACTUAL ROAD LOAD 8.0 KW(10.7 HP)
	GVW 2052 KG(4523 LBS)	GASOLINE EM-344

TEST NUMBER		131-32	131-33	
TEST CYCLE		SET	HFET	
RUN NUMBER		1	1	
DATE		5/24/78	5/24/78	/ /
ODOMETER		2184KM(1357MILES)	2205KM(1370MILES)	
CVS - BAG CART - DYNAMOMETER		2 - 1 - 3	2 - 1 - 3	
TEMPERATURE DEG. C (DEG. F)		23.9 / 75.0	24.4 / 76.0	
RELATIVE HUMIDITY, PCT		47.8	45.1	
BAROMETER, MM HG(IN HG)		739.4 (29.11)	739.6 (29.12)	
RUN TIME, SECONDS		1398	766	
BLOWER DIF P MM. H2O(IN. H2O)		762.0 (30.0)	762.0 (30.0)	
BLOWER INLET P MM. H2O(IN. H2O)		762.0 (30.0)	762.0 (30.0)	
BLOWER INLET TEMP. DEG. C(DEG. F)		44.4 (112.0)	44.4 (112.0)	
BLOWER REVOLUTIONS		112328	61601	
CVS FLOW STD. CU. METRES(SCF)		209.5 (7397.4)	115.1 (4064.6)	
HC SAMPLE METER/RANGE/PPM		25.2/ 2/ 25	25.6/ 2/ 26	
HC BCKGRD METER/RANGE/PPM		23.3/ 2/ 23	20.2/ 2/ 20	
CO SAMPLE METER/RANGE/PPM		87.9/12/ 209	49.3/13/ 47	
CO BCKGRD METER/RANGE/PPM		1.6/12/ 3	2.4/13/ 3	
CO2 SAMPLE METER/RANGE/PCT		46.4/ 2/ 2.08	52.7/ 2/ 2.44	
CO2 BCKGRD METER/RANGE/PCT		2.1/ 2/ .08	1.9/ 2/ .07	
NOX SAMPLE METER/RANGE/PPM		19.1/ 2/ 19	40.9/ 2/ 41	
NOX BCKGRD METER/RANGE/PPM		.6/ 2/ 1	1.0/ 2/ 1	
HC CONCENTRATION PPM		6	9	
CO CONCENTRATION PPM		195	42	
CO2 CONCENTRATION PCT		2.02	2.38	
NOX CONCENTRATION PPM		18.6	40.1	
HC MASS GRAMS		.67	.60	
CO MASS GRAMS		47.55	5.60	
CO2 MASS GRAMS		7738.3	5017.3	
NOX MASS GRAMS		7.07	8.31	
DFC, WET (DRY)		.893 (.835)	.818 (.811)	
SCF, WET (DRY)		1.000 (.972)	1.000 (.969)	
VOL (SCM)		209.5	115.1	
KM (MEASURED)		21.60	16.35	
TEST NUMBER,	PVMT	131-32	131-33	
BAROMETER,	MM HG	739.4	739.6	
HUMIDITY,	G/KG	9.1	8.8	
TEMPERATURE,	DEG C	23.9	24.4	
TOTAL FUEL SULFUR,	MG/KM	31.45	27.15	
AVG. EXH. OXYGEN,	PCT	3.45	3.65	
CATALYST AVG. TEMP.,	DEG C	705	632	
CATALYST MAX. TEMP.,	DEG C	761	700	
CARBON DIOXIDE,	G/KM	358.2	306.8	
FUEL CONSUMPTION,	L/100KM	15.44	13.12	
HYDROCARBONS,	G/KM	.03	.04	
CARBON MONOXIDE,	G/KM	2.20	.34	
OXIDES OF NITROGEN,	G/KM	.33	.51	

TABLE E-28. TEST 132 EMISSIONS RESULTS

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                         PVM - 132   FTP  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                          PROJECT 11-4771-001

TEST NO.   132-11   RUN   1                    VEHICLE NO.   13                        TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 CHEV.MALIBU CAL             DATE   7/28/78                          ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                      BAG CART NO.  1                         GASOLINE  EM-344
TRANSMISSION A3                                DYNO NO.      3                         ODOMETER   6135 KM(  3812 MILES)
GVW  2052 KG(  4523 LBS)                       CVS NO.       2

BAROMETER 743.20 MM HG(29.26 IN HG)            DRY BULB TEMP. 21.7 DEG C(71.0 DEG F)
RELATIVE HUMIDITY 60 PCT                       ABS. HUMIDITY 10.0 GM/KG
BAG RESULTS                                                                            NOX HUMIDITY CORRECTION FACTOR   .98
   BAG NUMBER                                        1                  2                  3                   4
   DESCRIPTION                                 COLD TRANSIENT      STABILIZED        HOT TRANSIENT        STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)               774.7 (30.5)       774.7 (30.5)       774.7 (30.5)       774.7 (30.5)
   BLOWER INLET P MM. H2O(IN. H2O)             774.7 (30.5)       774.7 (30.5)       774.7 (30.5)       774.7 (30.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)            43.3 (110.0)       43.3 (110.0)       44.4 (112.0)       43.3 (110.0)
   BLOWER REVOLUTIONS                             40724              69612              40550              69498
   CVS FLOW STD. CU. METRES(SCF)                76.4 (2698.3)     130.6 (4611.2)      75.9 (2681.4)     130.3 (4603.6)
   HC  SAMPLE METER/RANGE/PPM                  84.5/ 2/   84      19.2/ 2/   19      22.9/ 2/   23      16.7/ 2/   17
   HC  BCKGRD METER/RANGE/PPM                   9.9/ 2/   10      12.0/ 2/   12      10.0/ 2/   10      16.0/ 2/   16
   CO  SAMPLE METER/RANGE/PPM                  29.0/ 3/  696      19.0/13/   13      29.5/13/   23       7.3/13/    7
   CO  BCKGRD METER/RANGE/PPM                    .9/ 3/    4      12.7/13/   12       6.7/13/    7       5.5/13/    5
   CO2 SAMPLE METER/RANGE/PCT                  49.2/ 3/ 1.77      69.7/ 3/ 1.16      86.2/ 3/ 1.60      65.0/ 3/ 1.16
   CO2 BCKGRD METER/RANGE/PCT                   3.8/ 3/  .06       3.7/ 3/  .06       4.1/ 3/  .06       4.1/ 3/  .06
   NOX SAMPLE METER/RANGE/PPM                  21.1/ 2/   21      11.2/ 2/   11      18.1/ 2/   18      11.5/ 2/   11
   NOX BCKGRD METER/RANGE/PPM                   1.2/ 2/    1       1.0/ 2/    1       1.0/ 2/    1       1.1/ 2/    1
   DILUTION FACTOR                                  7.28              11.55               8.36               11.50

   HC  CONCENTRATION PPM                             78                  8                 14                   7
   CO  CONCENTRATION PPM                            651                  2                 16                   2
   CO2 CONCENTRATION PCT                           1.72               1.11               1.59                1.11
   NOX CONCENTRATION PPM                           20.1               10.3               17.2                10.5
   HC  MASS GRAMS                                  3.44                .62                .62                 .55
   CO  MASS GRAMS                                 57.95                .29               1.40                 .30
   CO2 MASS GRAMS                                2401.0             2642.2             2195.7              2638.0
   NOX MASS GRAMS                                  2.88               2.51               2.45                2.55

   HC  GRAMS/KM                                     .59                .10                .11                 .09
   CO  GRAMS/KM                                    9.93                .05                .24                 .05
   CO2 GRAMS/KM                                   411.6              424.0              378.6               426.3
   NOX GRAMS/KM                                     .49                .40                .42                 .41
   FUEL CONSUMPTION BY CB L/100KM                 18.31              18.11              15.83               18.21

   RUN TIME              SECONDS                    505                867                505                 865
   AVG. EXH. OXYGEN      PERCENT                   3.98               5.35               5.10                5.95
   CATALYST AVG. TEMP.   DEG. C                     336                524                465                 488
   CATALYST MAX. TEMP.   DEG. C                     580                587                576                 580
   MEASURED DISTANCE     KM                        5.83               6.23               5.80                6.19
        DFC, WET (DRY)                                  .895 ( .883)                          .941 ( .889)
        SCF, WET (DRY)                                 1.000 ( .974)                         1.000 ( .975)
        VOL (SCM)                                            207.0                                 206.2
        KM  (MEASURED)                                       12.07                                 11.99

COMPOSITE RESULTS
   TEST NUMBER                 132-11
   BAROMETER      MM HG         743.2    TOTAL FUEL SULFUR     MG/KM     27.56        CARBON DIOXIDE          G/KM        3-BAG        (4-BAG)
   HUMIDITY       G/KG           10.0    AVG. EXH. OXYGEN      PCT        5.08        FUEL CONSUMPTION        L/100KM     406.6      ( 407.2)
   TEMPERATURE    DEG C          21.7    CATALYST AVG. TEMP. DEG C        402         HYDROCARBONS (THC)      G/KM        17.53      ( 17.55)
                                         CATALYST MAX. TEMP. DEG C        584         CARBON MONOXIDE         G/KM          .20      (   .20)
                                                                                      OXIDES OF NITROGEN      G/KM         2.16      (  2.16)
                                                                                                                            .43      (   .43)


                         PVM - 132   SET  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                          PROJECT 11-4771-001

VEHICLE MODEL   78 CHEV.MALIBU CAL             VEHICLE NO.    13                       TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 5.0 L(305 CID) V-8                      TRANSMISSION A3                         ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
                                               GVW  2052 KG(  4523 LBS)                GASOLINE  EM-344
   TEST NUMBER                                      132-12                    132-13
   TEST CYCLE                                        SET                       HFET
   RUN NUMBER                                         1                          1
   DATE                                            7/28/78                    7/28/78
   ODOMETER                                  6145KM(  3819MILES)        6202KM(  3854MILES)                           /  /
   CVS - BAG CART - DYNAMOMETER                    2 - 1 - 3                  2 - 1 - 3

   TEMPERATURE DEG. C (DEG. F)                    22.2 / 72.0                25.6 / 78.0
   RELATIVE HUMIDITY, PCT                            44.4                       43.0
   BAROMETER, MM HG(IN HG)                       742.7 (29.24)              742.7 (29.24)
   RUN TIME, SECONDS                                 1397                        765

   BLOWER DIF P MM. H2O(IN. H2O)                774.7 (30.5)               774.7 (30.5)
   BLOWER INLET P MM. H2O(IN. H2O)              774.7 (30.5)               774.7 (30.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)             43.3 (110.0)               43.3 (110.0)
   BLOWER REVOLUTIONS                              112159                     61370
   CVS FLOW STD. CU. METRES(SCF)                210.2 (7423.5)             115.0 (4062.2)
   HC  SAMPLE METER/RANGE/PPM                   17.4/ 2/   17              18.5/ 2/   18
   HC  BCKGRD METER/RANGE/PPM                    9.9/ 2/   10              11.4/ 2/   11
   CO  SAMPLE METER/RANGE/PPM                   49.0/13/   41              37.5/13/   33
   CO  BCKGRD METER/RANGE/PPM                    8.0/13/    8               6.1/13/    6
   CO2 SAMPLE METER/RANGE/PCT                   91.3/ 2/ 1.81              96.9/ 2/ 2.11
   CO2 BCKGRD METER/RANGE/PCT                    1.8/ 2/  .07               1.7/ 2/  .06
   NOX SAMPLE METER/RANGE/PPM                   21.9/ 2/   22              31.9/ 2/   31
   NOX BCKGRD METER/RANGE/PPM                    1.5/ 2/    2               1.6/ 2/    2
   HC  CONCENTRATION PPM                              9                          9
   CO  CONCENTRATION PPM                             33                         26
   CO2 CONCENTRATION PCT                           1.75                       2.06
   NOX CONCENTRATION PPM                           20.4                       30.1
   HC  MASS GRAMS                                  1.07                        .59
   CO  MASS GRAMS                                  8.02                       3.51
   CO2 MASS GRAMS                                6740.6                     4333.1
   NOX MASS GRAMS                                  7.70                       6.25
        DFC, WET (DRY)                          .865 ( .856)               .942 ( .936)
        SCF, WET (DRY)                         1.000 ( .974)              1.000 ( .973)
        VOL (SCM)                                 210.2                      115.0
        KM  (MEASURED)                            21.67                      16.37

   TEST NUMBER,              PVMT                132-12                     132-13
   BAROMETER,                MM HG                742.7                      742.7
   HUMIDITY,                 G/KG                   8.4                        9.0
   TEMPERATURE,              DEG C                 22.2                       25.6
   TOTAL FUEL SULFUR,        MG/KM                28.26                      29.25

   AVG. EXH. OXYGEN,         PCT                   4.66                       4.23
   CATALYST AVG. TEMP.,      DEG C                  572                        615
   CATALYST MAX. TEMP.,      DEG C                  661                        661
   CARBON DIOXIDE,           G/KM                 308.2                      264.7
   FUEL CONSUMPTION,         L/100KM              13.19                      11.32

   HYDROCARBONS,             G/KM                   .05                        .04
   CARBON MONOXIDE,          G/KM                   .37                        .22
   OXIDES OF NITROGEN,       G/KM                   .35                        .38
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TABLE E-29. TEST 132 EMISSIONS RESULTS

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                         PVM - 132   FTP  VEHICLE EMISSIONS RESULTS - IGNITION MISFIRE
                                          PROJECT 11-4771-001

TEST NO.   132-21   RUN   1                  VEHICLE NO.   13                   TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 CHEV.MALIBU CAL           DATE    8/ 9/78                    ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                    BAG CART NO.  1                    GASOLINE  EM-399
TRANSMISSION A3                              DYNO NO.      3                    ODOMETER    6536 KM(  4061 MILES)
GVW  2052 KG(  4523 LBS)                     CVS NO.       2

BAROMETER 743.71 MM HG(29.28 IN HG)          DRY BULB TEMP. 21.7 DEG C(71.0 DEG F)
RELATIVE HUMIDITY 64 PCT                     ABS. HUMIDITY 10.6 GM/KG           NOX HUMIDITY CORRECTION FACTOR  1.00
BAG RESULTS
  BAG NUMBER                                        1                 2                   3                  4
  DESCRIPTION                                COLD TRANSIENT      STABILIZED        HOT TRANSIENT        STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)             774.7 (30.5)      774.7 (30.5)        774.7 (30.5)      774.7 (30.5)
   BLOWER INLET P MM. H2O(IN. H2O)           774.7 (30.5)      774.7 (30.5)        774.7 (30.5)      774.7 (30.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)          43.3 (110.0)      43.3 (110.0)        43.3 (110.0)      43.3 (110.0)
   BLOWER REVOLUTIONS                           40791              69693               40698              69601
   CVS FLOW STD. CU. METRES(SCF)             76.6 (2709.7)    130.8 (4620.2)       76.3 (2694.9)    130.6 (4614.0)
   HC  SAMPLE METER/RANGE/PPM                63.0/ 3/  630     36.9/ 2/   37       65.7/ 2/   66     33.8/ 2/   34
   HC  BCKGRD METER/RANGE/PPM                 1.1/ 3/   11     13.0/ 2/   13       11.0/ 2/   11     10.7/ 2/   11
   CO  SAMPLE METER/RANGE/PPM                30.5/ 3/  719     11.2/13/   11       45.3/13/   39     10.9/13/   10
   CO  BCKGRD METER/RANGE/PPM                  .2/ 3/    5      8.5/13/    8        5.3/13/    5      5.0/13/    5
   CO2 SAMPLE METER/RANGE/PCT                92.5/ 3/ 1.73     65.7/ 3/ 1.18       83.5/ 3/ 1.59     63.6/ 3/ 1.13
   CO2 BCKGRD METER/RANGE/PCT                 3.7/ 3/  .06      4.3/ 3/  .07        4.7/ 3/  .07      4.2/ 3/  .06
   NOX SAMPLE METER/RANGE/PPM                28.8/ 2/   29     18.8/ 2/   19       24.8/ 2/   25     18.6/ 2/   19
   NOX BCKGRD METER/RANGE/PPM                 1.1/ 2/    1       .8/ 2/    1         .9/ 2/    1       .9/ 2/    1
   DILUTION FACTOR                                7.20             11.39               8.63              11.76

   HC  CONCENTRATION PPM                          621                25                  56                 24
   CO  CONCENTRATION PPM                          671                 3                  32                  5
   CO2 CONCENTRATION PCT                         1.68              1.12                1.48               1.08
   NOX CONCENTRATION PPM                         27.9              18.1                24.0               18.0
   HC  MASS GRAMS                               27.41              1.89                2.46               1.81
   CO  MASS GRAMS                               59.85               .45                2.88                .79
   CO2 MASS GRAMS                              2350.6            2675.5              2065.9             2573.7
   NOX MASS GRAMS                                4.07              4.51                3.50               4.48

   HC  GRAMS/KM                                  4.80               .31                 .43                .30
   CO  GRAMS/KM                                 10.48               .07                 .50                .13
   CO2 GRAMS/KM                                 413.1             440.6               360.9              421.8
   NOX GRAMS/KM                                   .71               .74                 .61                .73
   FUEL CONSUMPTION BY CB L/100KM               18.48             18.85               15.49              18.05

   RUN TIME              SECONDS                  505               867                 505                866
   AVG. EXH. OXYGEN      PERCENT                 4.79              5.41                4.99               5.91
   CATALYST AVG. TEMP.   DEG. C                   392               638                 580                636
   CATALYST MAX. TEMP.   DEG. C                   699               704                 713                693
   MEASURED DISTANCE     KM                      5.71              6.07                5.72               6.10
        DFC, WET (DRY)                                  .893 ( .880)                           .904 ( .891)
        SCF, WET (DRY)                                 1.000 ( .973)                          1.000 ( .979)
        VOL (SCM)                                              207.4                                  206.9
        KM  (MEASURED)                                         11.78                                  11.83

COMPOSITE RESULTS                                                                                         3-BAG         (4-BAG)
   TEST NUMBER            132-21     TOTAL FUEL SULFUR   MG/KM   38.47     CARBON DIOXIDE       G/KM        412.8       ( 407.3)
   BAROMETER     MM HG    743.7      AVG. EXH. OXYGEN    PCT      5.21     FUEL CONSUMPTION     L/100KM     17.95       ( 17.72)
   HUMIDITY      G/KG      10.6      CATALYST AVG. TEMP. DEG C     587     HYDROCARBONS (THC)   G/KM         1.28       (  1.28)
   TEMPERATURE   DEG C     21.7      CATALYST MAX. TEMP. DEG C     713     CARBON MONOXIDE      G/KM         2.36       (  2.38)
                                                                           OXIDES OF NITROGEN   G/KM          .70       (   .70)


                         PVM - 132   SBT  VEHICLE EMISSIONS RESULTS - IGNITION MISFIRE
                                          PROJECT 11-4771-001

VEHICLE MODEL   78 CHEV.MALIBU CAL           VEHICLE NO.      13                  TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 5.0 L(305 CID) V-8                    TRANSMISSION A3                      ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
                                             GVW  2052 KG(  4523 LBS)             GASOLINE  EM-399

   TEST NUMBER                                 132-22                 132-23
   TEST CYCLE                                   SET                    HFET
   RUN NUMBER                                    1                      1
   DATE                                        8/ 9/78                8/ 9/78                    /  /
   ODOMETER                                  6565KM(  4079MILES)    6600KM(  4101MILES)
   CVS - BAG CART - DYNAMOMETER                2 - 1 - 3              2 - 1 - 3

   TEMPERATURE DEG. C (DEG. F)                22.2 / 72.0            24.4 / 76.0
   RELATIVE HUMIDITY, PCT                        53.1                   38.3
   BAROMETER, MM HG(IN HG)                    743.7 (29.28)          743.7 (29.28)
   RUN TIME, SECONDS                             1398                    766

   BLOWER DIF P MM. H2O(IN. H2O)              774.7 (30.5)           774.7 (30.5)
   BLOWER INLET P MM. H2O(IN. H2O)            774.7 (30.5)           774.7 (30.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)           43.3 (110.0)           44.4 (112.0)
   BLOWER REVOLUTIONS                           112260                  61478
   CVS FLOW STD. CU. METRES(SCF)              210.7 (7441.4)         115.2 (4067.6)
   HC  SAMPLE METER/RANGE/PPM                 35.5/ 2/   35          27.6/ 2/   28
   HC  BCKGRD METER/RANGE/PPM                 10.3/ 2/   10          10.3/ 2/   10
   CO  SAMPLE METER/RANGE/PPM                 61.6/13/   49          33.8/13/   30
   CO  BCKGRD METER/RANGE/PPM                  2.6/13/    3           2.8/13/    3
   CO2 SAMPLE METER/RANGE/PCT                 91.8/ 2/ 1.83          98.9/ 2/ 2.19
   CO2 BCKGRD METER/RANGE/PCT                  1.8/ 2/  .07           2.5/ 2/  .09
   NOX SAMPLE METER/RANGE/PPM                 28.3/ 2/   28          46.4/ 2/   46
   NOX BCKGRD METER/RANGE/PPM                   .7/ 2/    1            .9/ 2/    1
   HC  CONCENTRATION PPM                           27                     19
   CO  CONCENTRATION PPM                           45                     26
   CO2 CONCENTRATION PCT                         1.78                   2.12
   NOX CONCENTRATION PPM                         27.7                   45.6
   HC  MASS GRAMS                                3.23                   1.26
   CO  MASS GRAMS                               10.97                   3.52
   CO2 MASS GRAMS                              6859.3                 4463.7
   NOX MASS GRAMS                               10.59                   9.08
        DFC, WET (DRY)                        .863 ( .853)           .836 ( .831)
        SCF, WET (DRY)                       1.000 ( .972)          1.000 ( .979)
        VOL (SCM)                               210.7                  115.2
        KM  (MEASURED)                          21.35                  16.21

   TEST NUMBER,          PVM#                  132-22                 132-23
   BAROMETER,            MM HG                  743.7                  743.7
   HUMIDITY,             G/KG                     9.1                    7.5
   TEMPERATURE,          DEG C                   22.2                   24.4
   TOTAL FUEL SULFUR,    MG/KM                  29.50                  25.24

   AVG. EXH. OXYGEN,     PCT                     4.58                   4.28
   CATALYST AVG. TEMP.,  DEG C                    698                    736
   CATALYST MAX. TEMP.,  DEG C                    827                    800
   CARBON DIOXIDE,       G/KM                   321.3                  275.3
   FUEL CONSUMPTION,     L/100KM                13.77                  11.78

   HYDROCARBONS,         G/KM                     .15                    .08
   CARBON MONOXIDE,      G/KM                     .51                    .22
   OXIDES OF NITROGEN,   G/KM                     .50                    .56
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TABLE E-30. TEST 132 EMISSIONS RESULTS

```
                     PVM - 132   FTP   VEHICLE EMISSIONS RESULTS - IGNITION MISFIRE
                                       PROJECT 11-4771-001

TEST NO.   132-31   RUN  1
VEHICLE MODEL    78 CHEV.MALIBU CAL         VEHICLE NO.    13              TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 5.0 L(305 CID) V-8                   DATE     8/ 7/78               ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
TRANSMISSION A3                             BAG CART NO.  1                GASOLINE  EM-344
GVW  2052 KG(  4523 LBS)                    DYNO NO.      3                ODOMETER    6671 KM(  4145 MILES)
                                            CVS NO.       2
BAROMETER 744.98 MM HG(29.33 IN HG)         DRY BULB TEMP. 22.8 DEG C(73.0 DEG F)
RELATIVE HUMIDITY 61 PCT                    ABS. HUMIDITY 10.8 GM/KG
BAG RESULTS                                                                NOX HUMIDITY CORRECTION FACTOR  1.00
  BAG NUMBER                                       1                 2                  3                  4
  DESCRIPTION                               COLD TRANSIENT       STABILIZED        HOT TRANSIENT       STABILIZED

  BLOWER DIF P MM. H2O(IN. H2O)             749.3 (29.5)       749.3 (29.5)       749.3 (29.5)       749.3 (29.5)
  BLOWER INLET P MM. H2O(IN. H2O)           749.3 (29.5)       749.3 (29.5)       749.3 (29.5)       749.3 (29.5)
  BLOWER INLET TEMP. DEG. C(DEG. F)          41.7 (107.0)       42.2 (108.0)       43.3 (110.0)       43.3 (110.0)
  BLOWER REVOLUTIONS                           40995              69619              40686              69628
  CVS FLOW STD. CU. METRES(SCF)              77.5 (2738.5)     131.7 (4650.1)      76.8 (2712.4)     131.4 (4641.1)
  HC  SAMPLE METER/RANGE/PPM                 45.1/ 3/  451      33.9/ 2/   34      64.8/ 2/   65      34.2/ 2/   34
  HC  BCKGRD METER/RANGE/PPM                  1.1/ 3/   11      13.0/ 2/   13      11.1/ 2/   11      11.0/ 2/   11
  CO  SAMPLE METER/RANGE/PPM                 38.9/ 3/  711      15.8/13/   15      38.4/13/   34      13.4/13/   13
  CO  BCKGRD METER/RANGE/PPM                   .5/ 3/   11      10.6/13/   10       8.7/13/    8       4.6/13/    4
  CO2 SAMPLE METER/RANGE/PCT                 46.0/ 3/ 1.80      65.8/ 3/ 1.18      82.7/ 3/ 1.53      63.6/ 3/ 1.13
  CO2 BCKGRD METER/RANGE/PCT                  4.3/ 3/  .07       4.6/ 3/  .07       4.4/ 3/  .07       4.6/ 3/  .07
  NOX SAMPLE METER/RANGE/PPM                 30.0/ 2/   30      20.1/ 2/   20      25.6/ 2/   26      19.4/ 2/   19
  NOX BCKGRD METER/RANGE/PPM                  1.5/ 2/    2       1.4/ 2/    1       1.4/ 2/    1       1.0/ 2/    1
  DILUTION FACTOR                               6.99              11.32               8.72              11.78

  HC  CONCENTRATION PPM                          442                 22                 59                 24
  CO  CONCENTRATION PPM                          663                  5                 25                  9
  CO2 CONCENTRATION PCT                         1.75               1.11               1.47               1.07
  NOX CONCENTRATION PPM                         28.7               18.8               24.4               18.5
  HC  MASS GRAMS                               19.75               1.67               2.61               1.84
  CO  MASS GRAMS                               59.84                .80               2.22                .61
  CO2 MASS GRAMS                              2401.5             2687.4             2061.6             2570.3
  NOX MASS GRAMS                                4.28               4.76               3.54               4.66

  HC  GRAMS/KM                                  3.38                .27                .45                .30
  CO  GRAMS/KM                                 10.25                .13                .38                .10
  CO2 GRAMS/KM                                 425.1              420.8              353.9              413.8
  NOX GRAMS/KM                                   .73                .76                .62                .75
  FUEL CONSUMPTION BY CB L/100KM               19.24              18.34              15.14              17.71

  RUN TIME                 SECONDS               506                866                505                868
  AVG. EXH. OXYGEN         PERCENT              4.58               5.38               4.90               5.52
  CATALYST AVG. TEMP.      DEG. C                396                639                548                639
  CATALYST MAX. TEMP.      DEG. C                695                649                708                713
  MEASURED DISTANCE        KM                   5.84               6.27               5.83               6.21
       DFC, WET (DRY)                                 .891 ( .879)                          .904 ( .892)
       SCF, WET (DRY)                                1.000 ( .974)                         1.000 ( .975)
       VOL (SCM)                                           209.2                                 208.2
       KM  (MEASURED)                                      12.11                                 12.04

COMPOSITE RESULTS
  TEST NUMBER             132-31      TOTAL FUEL SULFUR    MG/KM   37.88                                 3-BAG        (4-BAG)
  BAROMETER      MM HG     745.0      AVG. EXH. OXYGEN     PCT      5.15    CARBON DIOXIDE      G/KM     407.4       ( 402.9)
  HUMIDITY       G/KG       10.8      CATALYST AVG. TEMP. DEG C     582    FUEL CONSUMPTION    L/100KM   17.67       ( 17.48)
  TEMPERATURE    DEG C      22.8      CATALYST MAX. TEMP. DEG C     708    HYDROCARBONS (THC)  G/KM        .96       (   .97)
                                                                            CARBON MONOXIDE     G/KM       2.30       (  2.29)
                                                                            OXIDES OF NITROGEN  G/KM        .71       (   .71)


                     PVM - 132   SET   VEHICLE EMISSIONS RESULTS - IGNITION MISFIRE
                                       PROJECT 11-4771-001

VEHICLE MODEL    78 CHEV.MALIBU CAL         VEHICLE NO.     13             TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 5.0 L(305 CID) V-8                   TRANSMISSION A3                ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
                                            GVW  2052 KG(  4523 LBS)       GASOLINE  EM-344

  TEST NUMBER                                  132-32                  132-33
  TEST CYCLE                                    SET                     FET
  RUN NUMBER                                     1                       1
  DATE                                        8/ 7/78                 8/ 7/78
  ODOMETER                              6700KM(  4163MILES)     6737KM(  4186MILES)                    /  /
  CVS - BAG CART - DYNAMOMETER               2 - 1 - 3               2 - 1 - 3

  TEMPERATURE DEG. C (DEG. F)               22.8 / 73.0             24.4 / 76.0
  RELATIVE HUMIDITY, PCT                       46.4                    44.4
  BAROMETER, MM HG(IN HG)                 744.7 (29.32)           744.7 (29.32)
  RUN TIME, SECONDS                            1398                     766

  BLOWER DIF P MM. H2O(IN. H2O)            749.3 (29.5)            749.3 (29.5)
  BLOWER INLET P MM. H2O(IN. H2O)          749.3 (29.5)            749.3 (29.5)
  BLOWER INLET TEMP. DEG. C(DEG. F)         43.3 (110.0)            43.3 (110.0)
  BLOWER REVOLUTIONS                          112214                   61962
  CVS FLOW STD. CU. METRES(SCF)            211.7 (7477.1)          116.0 (4095.4)
  HC  SAMPLE METER/RANGE/PPM               37.3/ 2/   37           31.2/ 2/   31
  HC  BCKGRD METER/RANGE/PPM               10.8/ 2/   11           11.0/ 2/   11
  CO  SAMPLE METER/RANGE/PPM               65.2/13/   52           39.0/13/   34
  CO  BCKGRD METER/RANGE/PPM                4.7/13/    5            3.5/13/    3
  CO2 SAMPLE METER/RANGE/PCT               41.6/ 2/ 1.82           47.2/ 2/ 2.13
  CO2 BCKGRD METER/RANGE/PCT                1.8/ 2/  .07            1.8/ 2/  .07
  NOX SAMPLE METER/RANGE/PPM               30.4/ 2/   31           43.4/ 2/   44
  NOX BCKGRD METER/RANGE/PPM                1.2/ 2/    1             .8/ 2/    1
  HC  CONCENTRATION PPM                         28                      22
  CO  CONCENTRATION PPM                         45                      24
  CO2 CONCENTRATION PCT                       1.77                    2.07
  NOX CONCENTRATION PPM                       29.4                    43.2
  HC  MASS GRAMS                              3.42                    1.47
  CO  MASS GRAMS                             11.11                    3.48
  CO2 MASS GRAMS                            6850.8                  4397.3
  NOX MASS GRAMS                             11.15                    4.01
       DFC, WET (DRY)                    .863 ( .856)            .891 ( .839)
       SCF, WET (DRY)                   1.000 ( .975)           1.000 ( .978)
       VOL (SCM)                             211.7                   116.0
       KM  (MEASURED)                        21.54                   16.24

  TEST NUMBER,             PVMT              132-32                  132-33
  BAROMETER,               MM HG              744.7                   744.7
  HUMIDITY,                G/KG                 8.2                     8.7
  TEMPERATURE,             DEG C               22.8                    24.4
  TOTAL FUEL SULFUR,       MG/KM              29.14                   29.03

  AVG. EXH. OXYGEN,        PCT                 4.77                    4.34
  CATALYST AVG. TEMP.,     DEG C                697                     726
  CATALYST MAX. TEMP.,     DEG C                804                     746
  CARBON DIOXIDE,          G/KM               317.2                   270.8
  FUEL CONSUMPTION,        L/100KM            13.60                   11.59

  HYDROCARBONS,            G/KM                 .16                     .09
  CARBON MONOXIDE,         G/KM                 .51                     .25
  OXIDES OF NITROGEN,      G/KM                 .52                     .55
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TABLE E-31. TEST 133 EMISSIONS RESULTS

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                            PVM - 133   FTP  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                             PROJECT 11-4771-001

TEST NO.   133-11   RUN   1                     VEHICLE NO.   13                    TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 CHEV MALIBU CAL              DATE    6/29/78                     ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                       BAG CART NO.  1                     GASOLINE  EM-399
TRANSMISSION A3                                 DYNO NO.      3                     ODOMETER   3879 KM(  2410 MILES)
GVW  2052 KG(  4523 LBS)                        CVS NO.       2

BAROMETER 744.97 MM HG(29.33 IN HG)             DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)
RELATIVE HUMIDITY 43 PCT                        ABS. HUMIDITY  8.9 GM/KG            NOX HUMIDITY CORRECTION FACTOR   .95
BAG RESULTS
   BAG NUMBER                                         1                   2                   3                   4
   DESCRIPTION                                 COLD TRANSIENT        STABILIZED         HOT TRANSIENT        STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)               736.6 (29.0)        736.6 (29.0)        736.6 (29.0)        736.6 (29.0)
   BLOWER INLET P MM. H2O(IN. H2O)             736.6 (29.0)        736.6 (29.0)        736.6 (29.0)        736.6 (29.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)            43.9 (111.0)        43.3 (110.0)        43.9 (111.0)        43.3 (110.0)
   BLOWER REVOLUTIONS                             40653               69593               40579               69979
   CVS FLOW STD. CU. METRES(SCF)               76.7 (2710.7)      131.5 (4643.9)       76.6 (2705.9)      131.3 (4636.2)
   HC  SAMPLE METER/RANGE/PPM                  78.4/ 2/   78       14.8/ 2/   15       16.8/ 2/   17       11.6/ 2/   12
   HC  BCKGRD METER/RANGE/PPM                   7.1/ 2/    7        7.5/ 2/    8        6.0/ 2/    6        5.4/ 2/    5
   CO  SAMPLE METER/RANGE/PPM                  47.3/11/  512        6.6/13/    6       13.8/13/   13        6.7/13/    7
   CO  BCKGRD METER/RANGE/PPM                   1.4/11/    4        4.2/13/    4        2.4/13/    2        1.1/13/    1
   CO2 SAMPLE METER/RANGE/PCT                  92.5/ 3/ 1.73       65.9/ 3/ 1.17       82.3/ 3/ 1.52       61.8/ 3/ 1.10
   CO2 BCKGRD METER/RANGE/PCT                   3.4/ 3/  .06        4.4/ 3/  .08        5.2/ 3/  .08        3.5/ 3/  .05
   NOX SAMPLE METER/RANGE/PPM                  20.2/ 2/   20       11.0/ 2/   11       15.9/ 2/   16        9.9/ 2/   10
   NOX BCKGRD METER/RANGE/PPM                   1.2/ 2/    1        1.2/ 2/    1        1.3/ 2/    1        1.1/ 2/    1
   DILUTION FACTOR                                  7.50               11.92                8.81               12.10

   HC  CONCENTRATION PPM                             72                   8                  11                   7
   CO  CONCENTRATION PPM                            484                   2                  10                   5
   CO2 CONCENTRATION PCT                           1.68                1.10                1.45                1.05
   NOX CONCENTRATION PPM                           19.2                 9.9                14.7                 8.9
   HC  MASS GRAMS                                  3.20                 .60                 .51                 .50
   CO  MASS GRAMS                                 43.28                 .38                 .89                 .81
   CO2 MASS GRAMS                                2359.6              2659.0              2029.0              2523.0
   NOX MASS GRAMS                                  2.66                2.35                2.09                2.11

   HC  GRAMS/KM                                     .56                 .10                 .09                 .08
   CO  GRAMS/KM                                    7.62                 .06                 .16                 .13
   CO2 GRAMS/KM                                   415.6               436.9               355.4               407.6
   NOX GRAMS/KM                                     .47                 .39                 .36                 .34
   FUEL CONSUMPTION BY CB L/100KM                 18.33               18.69               15.19               17.42

   RUN TIME            SECONDS                      505                 867                 505                 866
   AVG. EXH. OXYGEN    PERCENT                     4.58                5.69                5.17                5.47
   CATALYST AVG. TEMP.  DEG. C                        -                   -                 478                 593
   CATALYST MAX. TEMP.  DEG. C                        -                   -                 601                 611
   MEASURED DISTANCE   KM                          5.68                6.08                5.71                6.19
        DFC, WET (DRY)                                   .896 ( .889)                            .966 ( .900)
        SCF, WET (DRY)                                  1.000 ( .980)                           1.000 ( .981)
        VOL (SCM)                                               208.2                                   207.9
        KM  (MEASURED)                                          11.76                                   11.90

COMPOSITE RESULTS                                                                                       3-BAG        (4-BAG)
   TEST NUMBER            133-11        TOTAL FUEL SULFUR   MG/KM   37.77     CARBON DIOXIDE      G/KM     409.7     ( 401.4)
   BAROMETER     MM HG    744.9         AVG. EXH. OXYGEN    PCT      5.51     FUEL CONSUMPTION    L/100KM   17.62     ( 17.27)
   HUMIDITY      G/KG       8.9         CATALYST AVG. TEMP. DEG C     -       HYDROCARBONS (THC)  G/KM       .19     (   .19)
   TEMPERATURE   DEG C     25.6         CATALYST MAX. TEMP. DEG C    601      CARBON MONOXIDE     G/KM      1.66     (  1.68)
                                                                              OXIDES OF NITROGEN  G/KM       .40     (   .38)


                            PVM - 133   SET  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                             PROJECT 11-4771-001

                                                VEHICLE NO.    13                   TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 CHEV MALIBU CAL              TRANSMISSION A3                     ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                       GVW  2052 KG(  4523 LBS)            GASOLINE  EM-399

   TEST NUMBER                                     133-12                 133-13
   TEST CYCLE                                       SET                    HFET
   RUN NUMBER                                        1                      1
   DATE                                           6/29/78                6/29/78                      /  /
   ODOMETER                                   3907KM(  2428MILES)    3946KM(  2452MILES)
   CVS - BAG CART - DYNAMOMETER                   2 - 1 - 3              2 - 1 - 3

   TEMPERATURE DEG. C (DEG. F)                   25.6 / 78.0            26.7 / 80.0
   RELATIVE HUMIDITY, PCT                           44.6                   44.3
   BAROMETER, MM HG(IN HG)                      744.0 (29.29)          744.0 (29.29)
   RUN TIME, SECONDS                                1398                    779

   BLOWER DIF P MM. H2O(IN. H2O)                736.6 (29.0)           736.6 (29.0)
   BLOWER INLET P MM. H2O(IN. H2O)              736.6 (29.0)           736.6 (29.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)             43.9 (111.0)           43.9 (111.0)
   BLOWER REVOLUTIONS                              112144                  62295
   CVS FLOW STD. CU. METRES(SCF)               211.6 (7473.9)         117.9 (4164.7)
   HC  SAMPLE METER/RANGE/PPM                   17.7/ 2/   18          16.8/ 2/   17
   HC  BCKGRD METER/RANGE/PPM                   12.4/ 2/   12           4.0/ 2/    4
   CO  SAMPLE METER/RANGE/PPM                   41.6/13/   36          42.3/13/   37
   CO  BCKGRD METER/RANGE/PPM                    2.8/13/    3           2.3/13/    2
   CO2 SAMPLE METER/RANGE/PCT                   44.5/ 3/ 1.88          48.4/ 2/ 2.19
   CO2 BCKGRD METER/RANGE/PCT                    4.3/ 3/  .07           1.7/ 2/  .06
   NOX SAMPLE METER/RANGE/PPM                   20.4/ 2/   21          34.4/ 2/   34
   NOX BCKGRD METER/RANGE/PPM                    1.6/ 2/    2           1.4/ 2/    1
   HC  CONCENTRATION PPM                              7                      4
   CO  CONCENTRATION PPM                             32                     33
   CO2 CONCENTRATION PCT                           1.82                   2.14
   NOX CONCENTRATION PPM                           19.5                   33.2
   HC  MASS GRAMS                                   .86                    .63
   CO  MASS GRAMS                                  7.87                   4.48
   CO2 MASS GRAMS                                7057.5                 4603.1
   NOX MASS GRAMS                                  7.81                   7.26
        DFC, WET (DRY)                          .859 ( .851)           .836 ( .829)
        SCF, WET (DRY)                         1.000 ( .973)          1.000 ( .972)
        VOL (SCM)                                 211.6                  117.9
        KM  (MEASURED)                            21.57                  16.33

   TEST NUMBER,          PVMT                    133-12                 133-13
   BAROMETER,            MM HG                    744.0                  744.0
   HUMIDITY,             G/KG                      10.4                    9.9
   TEMPERATURE,          DEG C                     25.6                   26.7
   TOTAL FUEL SULFUR,    MG/KM                    24.99                  25.89

   AVG. EXH. OXYGEN,     PCT                       4.98                   4.21
   CATALYST AVG. TEMP.,  DEG C                      604                    623
   CATALYST MAX. TEMP.,  DEG C                      644                    704
   CARBON DIOXIDE,       G/KM                     327.2                  281.9
   FUEL CONSUMPTION,     L/100KM                  14.00                  12.06

   HYDROCARBONS,         G/KM                       .04                    .04
   CARBON MONOXIDE,      G/KM                       .37                    .27
   OXIDES OF NITROGEN,   G/KM                       .36                    .44
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TABLE E-32. TEST 133 EMISSIONS RESULTS

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                         PVM - 133   FTP  VEHICLE EMISSIONS RESULTS - DISABLED EGR
                                          PROJECT 11-4771-001

TEST NO.   133-21   RUN   1
VEHICLE MODEL    78 CHEV.MALIBU CAL           VEHICLE NO.   13                         TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 5.0 L(305 CID) V-8                     DATE    7/18/78                          ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
TRANSMISSION A3                               BAG CART NO.  1                          GASOLINE  EM-399
GVW  2052 KG(  4523 LBS)                      DYNO NO.      3                          ODOMETER   4273 KM(  2655 MILES)
                                              CVS NO.       2
BAROMETER 741.68 MM HG(29.20 IN HG)
RELATIVE HUMIDITY 59 PCT                      DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)
BAG RESULTS                                   ABS. HUMIDITY 10.0 GM/KG
  BAG NUMBER                                                                           NOX HUMIDITY CORRECTION FACTOR   .98
  DESCRIPTION                                        1                    2                    3                    4
                                              COLD TRANSIENT         STABILIZED         HOT TRANSIENT          STABILIZED

  BLOWER DIF P MM. H2O(IN. H2O)               762.0 (30.0)         762.0 (30.0)         762.0 (30.0)         762.0 (30.0)
  BLOWER INLET P MM. H2O(IN. H2O)             762.0 (30.0)         762.0 (30.0)         762.0 (30.0)         762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)            43.3 (110.0)         43.3 (110.0)         43.3 (110.0)         43.3 (110.0)
  BLOWER REVOLUTIONS                             40777                69608                40619                69690
  CVS FLOW STD. CU. METRES(SCF)                76.5 (2700.4)       130.5 (4608.4)        76.1 (2689.4)       130.6 (4614.2)
  HC  SAMPLE METER/RANGE/PPM                  70.1/ 2/    70       11.6/ 2/    12       17.2/ 2/    17       10.8/ 2/    11
  HC  BCKGRD METER/RANGE/PPM                   8.3/ 2/     8        8.4/ 2/     8        7.2/ 2/     7        7.2/ 2/     7
  CO  SAMPLE METER/RANGE/PPM                  98.3/11/   522       15.7/13/    15       10.2/13/    10        7.6/13/     7
  CO  BCKGRD METER/RANGE/PPM                   6.8/11/    21       15.7/13/    15        8.3/13/     8        5.7/13/     6
  CO2 SAMPLE METER/RANGE/PCT                  36.1/ 2/ 1.59        25.3/ 2/ 1.02        35.4/ 2/ 1.51        25.4/ 2/ 1.05
  CO2 BCKGRD METER/RANGE/PCT                   1.9/ 2/  .07         2.3/ 2/  .08         2.0/ 2/  .07         2.1/ 2/  .08
  NOX SAMPLE METER/RANGE/PPM                  23.5/ 3/    70       28.8/ 2/    29       80.8/ 2/    81       28.3/ 2/    28
  NOX BCKGRD METER/RANGE/PPM                    .6/ 3/     2        1.4/ 2/     1        1.8/ 2/     2        1.2/ 2/     1
  DILUTION FACTOR                                 8.39                13.05                 8.89                12.78

  HC  CONCENTRATION PPM                            63                    4                   11                    4
  CO  CONCENTRATION PPM                           979                    1                    2                    2
  CO2 CONCENTRATION PCT                          1.98                  .95                 1.44                  .98
  NOX CONCENTRATION PPM                          68.9                 27.5                 79.2                 27.2
  HC  MASS GRAMS                                 2.77                  .29                  .97                  .31
  CO  MASS GRAMS                                92.66                  .13                  .21                  .31
  CO2 MASS GRAMS                               2072.2               2269.0               2009.7               2348.6
  NOX MASS GRAMS                                 9.83                 6.70                11.26                 6.63

  HC  GRAMS/KM                                    .48                  .05                  .08                  .05
  CO  GRAMS/KM                                   7.39                  .02                  .04                  .05
  CO2 GRAMS/KM                                  359.0                366.0                349.3                380.5
  NOX GRAMS/KM                                   1.70                 1.08                 1.96                 1.07
  FUEL CONSUMPTION BY CB L/100KM                15.88                15.63                14.92                16.25

  RUN TIME               SECONDS                  506                  867                  505                  868
  AVG. EXH. OXYGEN       PERCENT                 4.78                 5.71                 5.67                 5.93
  CATALYST AVG. TEMP.    DEG. C                    -                    -                    -                    -
  CATALYST MAX. TEMP.    DEG. C                    -                    -                    -                    -
  MEASURED DISTANCE      KM                      5.77                 6.19                 5.78                 6.17
      DFC, WET (DRY)                                  .908 ( .898)                              .909 ( .899)
      SCF, WET (DRY)                                 1.000 ( .978)                             1.000 ( .978)
      VOL (SCM)                                              206.9                                     206.8
      KM  (MEASURED)                                         11.96                                     11.93

COMPOSITE RESULTS
  TEST NUMBER              133-21
  BAROMETER     MM HG      741.7    TOTAL FUEL SULFUR    MG/KM   33.19     CARBON DIOXIDE        G/KM       3-BAG     (4-BAG)
  HUMIDITY      G/KG        10.0    AVG. EXH. OXYGEN     PCT      5.55     FUEL CONSUMPTION      L/100KM    360.0     ( 364.2)
  TEMPERATURE   DEG C       23.3    CATALYST AVG. TEMP. DEG C       -      HYDROCARBONS (THC)    G/KM       15.49     ( 15.67)
                                    CATALYST MAX. TEMP. DEG C       -      CARBON MONOXIDE       G/KM         .15     (   .15)
                                                                           OXIDES OF NITROGEN    G/KM        1.55     (  1.56)
                                                                                                             1.95     (  1.95)


                         PVM - 133   SET  VEHICLE EMISSIONS RESULTS - DISABLED EGR
                                          PROJECT 11-4771-001

VEHICLE MODEL    78 CHEV.MALIBU CAL           VEHICLE NO.      13                      TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 5.0 L(305 CID) V-8                     TRANSMISSION A3                          ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
                                              GVW  2052 KG(  4523 LBS)                 GASOLINE  EM-399
   TEST NUMBER
   TEST CYCLE                                      133-22                 133-23
   RUN NUMBER                                      SET                    HFET
   DATE                                            2                      2
   ODOMETER                                        7/17/78                7/13/78
   CVS - BAG CART - DYNAMOMETER                4485KM(  2787MILES)    4447KM(  2763MILES)
                                                 2 - 1 - 3              2 - 1 - 2
   TEMPERATURE DEG. C (DEG. F)
   RELATIVE HUMIDITY, PCT                        26.7 / 80.0            26.1 / 79.0
   BAROMETER, MM HG(IN HG)                          41.3                   40.6
   RUN TIME, SECONDS                             740.9 (29.15)          742.2 (29.22)
                                                     1397                    766
   BLOWER DIF P MM. H2O(IN. H2O)
   BLOWER INLET P MM. H2O(IN. H2O)               762.0 (30.0)           812.8 (32.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)             762.0 (30.0)           812.8 (32.0)
   BLOWER REVOLUTIONS                             43.3 (110.0)           43.3 (110.0)
   CVS FLOW STD. CU. METRES(SCF)                    112004                 61484
   HC  SAMPLE METER/RANGE/PPM                   209.6 (7401.4)         114.5 (4044.6)
   HC  BCKGRD METER/RANGE/PPM                   10.6/ 2/    11         12.3/ 2/    12
   CO  SAMPLE METER/RANGE/PPM                    6.0/ 2/     6          6.5/ 2/     7
   CO  BCKGRD METER/RANGE/PPM                    8.4/13/     8          4.9/13/     4
   CO2 SAMPLE METER/RANGE/PCT                    3.3/13/     3          2.5/13/     2
   CO2 BCKGRD METER/RANGE/PCT                   86.8/ 3/ 1.61          92.2/ 2/ 1.85
   NOX SAMPLE METER/RANGE/PPM                    7.5/ 3/  .05           1.9/ 2/  .07
   NOX BCKGRD METER/RANGE/PPM                   89.6/ 2/    85         96.7/ 3/   190
   HC  CONCENTRATION PPM                         2.1/ 2/     2           .3/ 3/     1
   CO  CONCENTRATION PPM                              5                      7
   CO2 CONCENTRATION PCT                              5                      2
   NOX CONCENTRATION PPM                           1.56                   1.80
   HC  MASS GRAMS                                  82.0                  139.3
   CO  MASS GRAMS                                   .69                    .44
   CO2 MASS GRAMS                                  1.21                    .27
   NOX MASS GRAMS                                6002.7                 3765.4
       DFC, WET (DRY)                             31.63                  28.66
       SCF, WET (DRY)                          .880 ( .879)           .861 ( .856)
       VOL (SCM)                              1.000 ( .978)          1.000 ( .976)
       KM  (MEASURED)                             209.6                  114.5
                                                  21.70                  16.93
   TEST NUMBER,          PVMT
   BAROMETER,            MM HG                   133-22                 133-23
   HUMIDITY,             G/KG                    740.9                  742.2
   TEMPERATURE,          DEG C                     9.2                    8.7
   TOTAL FUEL SULFUR,    MG/KM                    26.7                   26.1
                                                  25.22                  20.48
   AVG. EXH. OXYGEN,     PCT
   CATALYST AVG. TEMP.,  DEG C                    5.04                   4.96
   CATALYST MAX. TEMP.,  DEG C                     506                    518
   CARBON DIOXIDE,       G/KM                      610                    584
   FUEL CONSUMPTION,     L/100KM                 275.6                  229.2
                                                  11.77                   9.79
   HYDROCARBONS,         G/KM
   CARBON MONOXIDE,      G/KM                      .03                    .03
   OXIDES OF NITROGEN,   G/KM                      .06                    .02
                                                  1.95                   1.79
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TABLE E-33. TEST 133 EMISSIONS RESULTS

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                     PVM - 133   FTP  VEHICLE EMISSIONS RESULTS - DISABLED EGR
                                      PROJECT 11-4771-001

TEST NO.   133-31   RUN   1                 VEHICLE NO.   13                  TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 CHEV.MALIBU CAL          DATE    7/13/78                   ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                   BAG CART NO.  1                   GASOLINE  EM-399
TRANSMISSION A3                             DYNO NO.      2                   ODOMETER   4356 KM(  2707 MILES)
GVW  2052 KG(  4523 LBS)                    CVS NO.       2

BAROMETER 741.17 MM HG(29.18 IN HG)         DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)
RELATIVE HUMIDITY 57 PCT                    ABS. HUMIDITY  9.8 GM/KG           NOX HUMIDITY CORRECTION FACTOR   .97
BAG RESULTS
  BAG NUMBER                                     1                 2                  3                  4
  DESCRIPTION                              COLD TRANSIENT      STABILIZED        HOT TRANSIENT       STABILIZED

  BLOWER DIF P MM. H2O(IN. H2O)            787.9 (31.0)       787.9 (31.0)       787.9 (31.0)       787.9 (31.0)
  BLOWER INLET P MM. H2O(IN. H2O)          787.9 (31.0)       787.9 (31.0)       787.9 (31.0)       787.9 (31.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)         43.3 (110.0)       43.3 (110.0)       43.3 (110.0)       43.3 (110.0)
  BLOWER REVOLUTIONS                          41137              70228              40580              69557
  CVS FLOW STD. CU. METRES(SCF)             76.8 (2712.4)     131.1 (4631.5)      75.7 (2675.0)     129.8 (4585.1)
  HC  SAMPLE METER/RANGE/PPM               75.7/ 2/   76      10.9/ 2/   10      19.1/ 2/   19       9.9/ 2/    9
  HC  BCKGRD METER/RANGE/PPM                6.8/ 2/    7       7.2/ 2/    7       5.6/ 2/    6       5.9/ 2/    6
  CO  SAMPLE METER/RANGE/PPM               23.9/ 3/  591      21.6/13/   20      15.5/13/   15      11.9/13/   11
  CO  BCKGRD METER/RANGE/PPM                1.5/ 3/   39      21.0/13/   20      12.1/13/   12       9.8/13/    9
  CO2 SAMPLE METER/RANGE/PCT               35.6/ 2/ 1.52      25.1/ 2/ 1.02      31.8/ 2/ 1.33      23.7/ 2/  .95
  CO2 BCKGRD METER/RANGE/PCT                1.8/ 2/  .07       2.2/ 2/  .08       1.9/ 2/  .07       2.2/ 2/  .08
  NOX SAMPLE METER/RANGE/PPM               69.0/ 2/   69      28.7/ 2/   29      67.2/ 2/   67      25.8/ 2/   25
  NOX BCKGRD METER/RANGE/PPM                1.7/ 2/    2       1.7/ 2/    2       1.9/ 2/    1       1.1/ 2/    1
  DILUTION FACTOR                              8.51              13.16              10.06              14.09

  HC  CONCENTRATION PPM                        70                  4                  9                  4
  CO  CONCENTRATION PPM                       486                  2                  4                  2
  CO2 CONCENTRATION PCT                      1.46                .99               1.27                .88
  NOX CONCENTRATION PPM                      67.5               27.1               65.9               24.2
  HC  MASS GRAMS                             3.09                .28                .40                .30
  CO  MASS GRAMS                            43.45                .29                .33                .36
  CO2 MASS GRAMS                           2050.4             2261.3             1757.3             2087.6
  NOX MASS GRAMS                             9.62               6.60               9.26               5.82

  HC  GRAMS/KM                                .53                .05                .07                .05
  CO  GRAMS/KM                               7.51                .09                .06                .06
  CO2 GRAMS/KM                              359.6              366.1              309.0              338.7
  NOX GRAMS/KM                               1.66               1.07               1.68                .99
  FUEL CONSUMPTION BY CB L/100KM            15.71              15.59              12.99              14.47

  RUN TIME              SECONDS               508                866                505                867
  AVG. EXH. OXYGEN      PERCENT              4.60               5.90               5.23               5.95
  CATALYST AVG. TEMP.   DEG. C                287                457                402                463
  CATALYST MAX. TEMP.   DEG. C                487                499                518                512
  MEASURED DISTANCE     KM                   5.70               6.19               5.70               6.16
       DFC, WET (DRY)                              .909 ( .898)                          .918 ( .907)
       SCF, WET (DRY)                             1.000 ( .977)                         1.000 ( .978)
       VOL (SCM)                                        207.9                                205.6
       KM  (MEASURED)                                   11.90                                11.94

COMPOSITE RESULTS
  TEST NUMBER           133-31                                                                    3-BAG       (4-BAG)
  BAROMETER     MM HG   741.2      TOTAL FUEL SULFUR   MG/KM   31.93    CARBON DIOXIDE      G/KM      346.1      ( 338.3)
  HUMIDITY      G/KG      9.8      AVG. EXH. OXYGEN    PCT      5.29    FUEL CONSUMPTION    L/100KM    14.90      ( 14.57)
  TEMPERATURE   DEG C    22.2      CATALYST AVG. TEMP. DEG C     419    HYDROCARBONS (THC)  G/KM        .15      (   .15)
                                   CATALYST MAX. TEMP. DEG C     512    CARBON MONOXIDE     G/KM       1.60      (  1.60)
                                                                        OXIDES OF NITROGEN  G/KM       1.39      (  1.38)


                     PVM - 133   SET  VEHICLE EMISSIONS RESULTS - DISABLED EGR
                                      PROJECT 11-4771-001

                                            VEHICLE NO.     13                   TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 CHEV.MALIBU CAL          TRANSMISSION A3                      ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                   GVW  2052 KG(  4523 LBS)             GASOLINE  EM-399

  TEST NUMBER                                  133-32                 133-33
  TEST CYCLE                                    SET                    HFET
  RUN NUMBER                                     1                      1
  DATE                                        7/13/78                7/13/78                      / /
  ODOMETER                               4387KM(  2726MILES)    4429KM(  2749MILES)
  CVS - BAG CART - DYNAMOMETER                2 - 1 - 2              2 - 1 - 2

  TEMPERATURE DEG. C (DEG. F)               23.9 / 75.0            26.1 / 79.0
  RELATIVE HUMIDITY, PCT                        40.9                   43.7
  BAROMETER, MM HG(IN HG)                  742.2 (29.22)          742.2 (29.22)
  RUN TIME, SECONDS                             1397                    765

  BLOWER DIF P MM. H2O(IN. H2O)             787.9 (31.0)           800.1 (31.5)
  BLOWER INLET P MM. H2O(IN. H2O)           787.9 (31.0)           800.1 (31.5)
  BLOWER INLET TEMP. DEG. C(DEG. F)          43.3 (110.0)           43.3 (110.0)
  BLOWER REVOLUTIONS                            112605                  61627
  CVS FLOW STD. CU. METRES(SCF)            210.5 (7435.4)         115.0 (4061.7)
  HC  SAMPLE METER/RANGE/PPM               13.0/ 2/   13          12.6/ 2/   13
  HC  BCKGRD METER/RANGE/PPM                8.0/ 2/    8           7.2/ 2/    7
  CO  SAMPLE METER/RANGE/PPM               11.1/13/   11           7.0/13/    7
  CO  BCKGRD METER/RANGE/PPM                6.1/13/    6           3.1/13/    3
  CO2 SAMPLE METER/RANGE/PCT               85.1/ 3/ 1.58          42.2/ 2/ 1.85
  CO2 BCKGRD METER/RANGE/PCT                4.5/ 3/  .07           1.7/ 2/  .06
  NOX SAMPLE METER/RANGE/PPM               79.6/ 2/   80          48.0/ 3/  144
  NOX BCKGRD METER/RANGE/PPM                2.3/ 2/    2           1.9/ 3/    4
  HC  CONCENTRATION PPM                          6                      6
  CO  CONCENTRATION PPM                          5                      4
  CO2 CONCENTRATION PCT                       1.51                   1.80
  NOX CONCENTRATION PPM                       77.6                  140.9
  HC  MASS GRAMS                               .72                    .42
  CO  MASS GRAMS                              1.23                    .52
  CO2 MASS GRAMS                            5839.6                 3798.1
  NOX MASS GRAMS                             28.43                  29.64
       DFC, WET (DRY)                     .882 ( .876)           .861 ( .855)
       SCF, WET (DRY)                    1.000 ( .979)          1.000 ( .975)
       VOL (SCM)                             210.5                  115.0
       KM  (MEASURED)                        21.65                  16.39

  TEST NUMBER,          PVMT                 133-32                 133-33
  BAROMETER,            MM HG                742.2                  742.2
  HUMIDITY,             G/KG                   7.7                    9.9
  TEMPERATURE,          DEG C                 23.9                   26.1
  TOTAL FUEL SULFUR,    MG/KM                24.69                  21.20

  AVG. EXH. OXYGEN,     PCT                   5.35                   5.00
  CATALYST AVG. TEMP.,  DEG C                  512                    542
  CATALYST MAX. TEMP.,  DEG C                  606                    584
  CARBON DIOXIDE,       G/KM                 269.7                  231.6
  FUEL CONSUMPTION,     L/100KM              11.52                   9.89

  HYDROCARBONS,         G/KM                   .03                    .03
  CARBON MONOXIDE,      G/KM                   .06                    .03
  OXIDES OF NITROGEN,   G/KM                  1.31                   1.81
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TABLE E-34. TEST 135 EMISSIONS RESULTS

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PVM - 135   FTP   VEHICLE EMISSIONS RESULTS - UNMODIFIED
                  PROJECT 11-4771-001

TEST NO.   135-11   RUN   1               VEHICLE NO.   13                        TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 CHEV.MALIBU CAL        DATE     8/21/78                        ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                 BAG CART NO.  1                         GASOLINE  EM-399
TRANSMISSION A3                           DYNO NO.      3                         ODOMETER   8367 KM(  5199 MILES)
GVW  2052 KG(  4523 LBS)                  CVS NO.       2

BAROMETER 744.73 MM HG(29.32 IN HG)       DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)
RELATIVE HUMIDITY 61 PCT                  ABS. HUMIDITY 10.9 GM/KG
BAG RESULTS                                                                       NOX HUMIDITY CORRECTION FACTOR   .99
   BAG NUMBER                                     1                  2                   3                   4
   DESCRIPTION                            COLD TRANSIENT         STABILIZED        HOT TRANSIENT         STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)          762.0 (30.0)        762.0 (30.0)        762.0 (30.0)        762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)        762.0 (30.0)        762.0 (30.0)        762.0 (30.0)        762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)       43.3 (110.0)        43.3 (110.0)        43.3 (110.0)        43.3 (110.0)
   BLOWER REVOLUTIONS                        40658               69696               40701               69679
   CVS FLOW STD. CU. METRES(SCF)           76.6 (2704.7)      131.3 (4636.0)       76.7 (2707.4)      131.2 (4634.5)
   HC  SAMPLE METER/RANGE/PPM             82.0/ 2/   82       17.3/ 2/   17       21.2/ 2/   21       16.9/ 2/   17
   HC  BCKGRD METER/RANGE/PPM             13.2/ 2/   13       13.0/ 2/   13       12.6/ 2/   13       12.8/ 2/   13
   CO  SAMPLE METER/RANGE/PPM             37.8/ 3/  898       10.9/13/   10       26.6/13/   24        8.1/13/    8
   CO  BCKGRD METER/RANGE/PPM               .3/ 3/    7        5.6/13/    5        3.5/13/    3        3.0/13/    3
   CO2 SAMPLE METER/RANGE/PCT             91.7/ 3/ 1.71       63.2/ 3/ 1.13       79.7/ 3/ 1.46       59.0/ 3/ 1.06
   CO2 BCKGRD METER/RANGE/PCT              3.9/ 3/  .06        4.9/ 3/  .08        4.4/ 3/  .07        4.4/ 3/  .07
   NOX SAMPLE METER/RANGE/PPM             17.9/ 2/   18        9.3/ 2/    9       13.9/ 2/   14        8.7/ 2/    9
   NOX BCKGRD METER/RANGE/PPM               .7/ 2/    1         .9/ 2/    0         .6/ 2/    1         .3/ 2/    0
   DILUTION FACTOR                            7.42               11.86                9.13               12.62

   HC  CONCENTRATION PPM                        71                   5                  10                   5
   CO  CONCENTRATION PPM                       895                   5                  20                   5
   CO2 CONCENTRATION PCT                      1.66                1.06                1.40                1.00
   NOX CONCENTRATION PPM                      17.3                 8.4                13.4                 8.4
   HC  MASS GRAMS                             3.12                 .41                 .44                 .39
   CO  MASS GRAMS                            75.31                 .71                1.80                 .79
   CO2 MASS GRAMS                           2330.9              2544.6              1969.9              2396.1
   NOX MASS GRAMS                             2.51                2.22                1.94                2.09

   HC  GRAMS/KM                                .54                 .07                 .08                 .06
   CO  GRAMS/KM                              13.06                 .12                 .31                 .13
   CO2 GRAMS/KM                              404.3               417.1               342.6               391.6
   NOX GRAMS/KM                                .43                 .36                 .34                 .34
   FUEL CONSUMPTION BY CB L/100KM            18.20               17.88               14.68               16.73

   RUN TIME              SECONDS               505                 866                 506                 866
   AVG. EXH. OXYGEN      PERCENT              4.91                5.22                4.90                5.51
   CATALYST AVG. TEMP.   DEG. C                357                 524                 496                 527
   CATALYST MAX. TEMP.   DEG. C                580                 593                 588                 547
   MEASURED DISTANCE     KM                   5.77                6.10                5.75                6.12
      DFC, WET (DRY)                        .897 ( .885)                            .910 ( .898)
      SCF, WET (DRY)                       1.000 ( .979)                           1.000 ( .976)
      VOL (SCM)                                  207.8                                   207.9
      KM  (MEASURED)                             11.86                                   11.87

COMPOSITE RESULTS
   TEST NUMBER              135-11     TOTAL FUEL SULFUR   MG/KM   36.98     CARBON DIOXIDE       G/KM       3-BAG     (4-BAG)
   BAROMETER    MM HG        744.7     AVG. EXH. OXYGEN    PCT      5.03     FUEL CONSUMPTION     L/100KM    393.8     ( 386.9)
   HUMIDITY     G/KG          10.9     CATALYST AVG. TEMP. DEG C     488     HYDROCARBONS (THC)   G/KM       17.02     ( 16.71)
   TEMPERATURE  DEG C         22.2     CATALYST MAX. TEMP. DEG C     593     CARBON MONOXIDE      G/KM         .17     (   .17)
                                                                             OXIDES OF NITROGEN   G/KM        2.88     (  2.88)
                                                                                                                .37     (   .36)


PVM - 135   SBT   VEHICLE EMISSIONS RESULTS - UNMODIFIED
                  PROJECT 11-4771-001

VEHICLE MODEL   78 CHEV.MALIBU CAL        VEHICLE NO.    13                       TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 5.0 L(305 CID) V-8                 TRANSMISSION A3                         ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
                                          GVW  2052 KG(  4523 LBS)                GASOLINE  EM-399
   TEST NUMBER
   TEST CYCLE                                   135-12                 135-13
   RUN NUMBER                                    SET                    HFET
   DATE                                           1                      1
   ODOMETER                                    8/21/78                8/21/78                          /  /
   CVS - BAG CART - DYNAMOMETER           8396KM(  5217MILES)    8433KM(  5240MILES)
                                               2 - 1 - 3              2 - 1 - 3
   TEMPERATURE DEG. C (DEG. F)
   RELATIVE HUMIDITY, PCT                      23.9 / 75.0            24.4 / 76.0
   BAROMETER, MM HG(IN HG)                        44.2                   38.3
   RUN TIME, SECONDS                           745.5 (29.35)          745.5 (29.35)
                                                  1397                   766
   BLOWER DIF P MM. H2O(IN. H2O)
   BLOWER INLET P MM. H2O(IN. H2O)             762.0 (30.0)           762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)           762.0 (30.0)           762.0 (30.0)
   BLOWER REVOLUTIONS                           43.3 (110.0)           43.9 (111.0)
   CVS FLOW STD. CU. METRES(SCF)                 112309                 61553
   HC  SAMPLE METER/RANGE/PPM                  211.7 (7476.3)         115.9 (4094.4)
   HC  BCKGRD METER/RANGE/PPM                  18.1/ 2/   18          16.3/ 2/   16
   CO  SAMPLE METER/RANGE/PPM                  12.8/ 2/   13          11.6/ 2/   12
   CO  BCKGRD METER/RANGE/PPM                  57.5/13/   47          28.0/13/   26
   CO2 SAMPLE METER/RANGE/PCT                   2.1/13/    2           3.3/13/    3
   CO2 BCKGRD METER/RANGE/PCT                  90.6/ 2/ 1.77          95.5/ 2/ 2.03
   NOX SAMPLE METER/RANGE/PPM                   1.6/ 2/  .06           1.6/ 2/  .06
   NOX BCKGRD METER/RANGE/PPM                  19.3/ 2/   19          30.9/ 2/   31
   HC  CONCENTRATION PPM                         .6/ 2/    1            .9/ 2/    1
   CO  CONCENTRATION PPM                            7                      6
   CO2 CONCENTRATION PCT                           43                     22
   NOX CONCENTRATION PPM                          1.72                   1.99
   HC  MASS GRAMS                                 18.0                   30.1
   CO  MASS GRAMS                                  .85                    .43
   CO2 MASS GRAMS                                10.59                   2.98
   NOX MASS GRAMS                               6671.9                 4210.8
      DFC, WET (DRY)                              7.06                   6.03
      SCF, WET (DRY)                         .867 ( .861)           .898 ( .893)
      VOL (SCM)                             1.000 ( .976)          1.000 ( .975)
      KM  (MEASURED)                             211.7                  115.9
                                                 21.63                  16.39
   TEST NUMBER,           PVMT
   BAROMETER,             MM HG                 135-12                 135-13
   HUMIDITY,              G/KG                   745.5                  745.5
   TEMPERATURE,           DEG C                    8.3                    7.4
   TOTAL FUEL SULFUR,     MG/KM                   23.9                   24.4
                                                 28.30                  23.60
   AVG. EXH. OXYGEN,      PCT
   CATALYST AVG. TEMP.,   DEG C                   4.68                   4.37
   CATALYST MAX. TEMP.,   DEG C                    601                    613
   CARBON DIOXIDE,        G/KM                     708                    674
   FUEL CONSUMPTION,      L/100KM                308.5                  257.6
                                                 13.21                  11.01
   HYDROCARBONS,          G/KM
   CARBON MONOXIDE,       G/KM                     .04                    .03
   OXIDES OF NITROGEN,    G/KM                     .49                    .18
                                                   .33                    .37
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TABLE E-35. TEST 135 EMISSIONS RESULTS

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                         PVM - 135   FTP  VEHICLE EMISSIONS RESULTS - NO AIR INJ. + R.O.I.
                                          PROJECT 11-4771-001

TEST NO.    135-21   RUN   1                VEHICLE NO.   13               TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL    78 CHEV.MALIBU CAL         DATE    8/23/78                ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                   BAG CART NO.  1                GASOLINE  EM-399
TRANSMISSION A3                             DYNO NO.      3                ODOMETER   8750 KM(  5437 MILES)
GVW  2052 KG(  4523 LBS)                    CVS NO.       2

BAROMETER 752.94 MM HG(29.64 IN HG)         DRY BULB TEMP. 22.8 DEG C(73.0 DEG F)
RELATIVE HUMIDITY 61 PCT                    ABS. HUMIDITY 10.9 GM/KG        NOX HUMIDITY CORRECTION FACTOR  1.01
BAG RESULTS
   BAG NUMBER                                     1                  2                  3                  4
   DESCRIPTION                              COLD TRANSIENT       STABILIZED        HOT TRANSIENT       STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)            749.3 (29.5)       749.3 (29.5)       749.3 (29.5)       749.3 (29.5)
   BLOWER INLET P MM. H2O(IN. H2O)          749.3 (29.5)       749.3 (29.5)       749.3 (29.5)       749.3 (29.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)         43.3 (110.0)       43.3 (110.0)       43.3 (110.0)       43.3 (110.0)
   BLOWER REVOLUTIONS                          40725              69848              40732              69666
   CVS FLOW STD. CU. METRES(SCF)             76.6 (2705.1)     131.9 (4658.5)      76.6 (2705.5)     131.0 (4626.7)
   HC  SAMPLE METER/RANGE/PPM               21.1/ 3/  211      12.1/ 3/  121      11.2/ 3/  112      11.3/ 3/  113
   HC  BCKGRD METER/RANGE/PPM                1.6/ 3/   16       1.1/ 3/   11       1.3/ 3/   13       1.2/ 3/   12
   CO  SAMPLE METER/RANGE/PPM               68.9/ 2/ 3663      59.9/ 2/ 2673      47.9/ 2/ 2236      50.7/ 2/ 2437
   CO  BCKGRD METER/RANGE/PPM                 .9/ 2/   15        .9/ 2/   15        .3/ 2/   11        .9/ 2/   15
   CO2 SAMPLE METER/RANGE/PCT               80.9/ 3/ 1.49      53.7/ 3/  .94      70.3/ 3/ 1.27      51.9/ 3/  .89
   CO2 BCKGRD METER/RANGE/PCT                4.3/ 3/  .07       3.6/ 3/  .06       4.5/ 3/  .07       4.6/ 3/  .07
   NOX SAMPLE METER/RANGE/PPM               15.5/ 2/   15       6.9/ 2/    6      11.7/ 2/   12       6.2/ 2/    6
   NOX BCKGRD METER/RANGE/PPM                1.0/ 2/    1        .8/ 2/    1        .5/ 2/    1        .8/ 2/    1
   DILUTION FACTOR                               7.81              11.09               8.96              11.75

   HC  CONCENTRATION PPM                         197                111                100                102
   CO  CONCENTRATION PPM                        3493               2558               2127               2333
   CO2 CONCENTRATION PCT                        1.43                .89               1.21                .83
   NOX CONCENTRATION PPM                        14.6                5.4               11.3                5.7
   HC  MASS GRAMS                               8.71               8.91               4.44               7.71
   CO  MASS GRAMS                             309.74             391.59             189.71             355.95
   CO2 MASS GRAMS                             2007.8             2139.1             1695.8             1989.8
   NOX MASS GRAMS                               2.16               1.50               1.66               1.45

   HC  GRAMS/KM                                 1.51               1.37                .77               1.25
   CO  GRAMS/KM                                53.65              63.61              32.91              57.70
   CO2 GRAMS/KM                                347.7              347.5              294.2              322.6
   NOX GRAMS/KM                                  .37                .24                .29                .23
   FUEL CONSUMPTION BY CB L/100KM              18.64              19.24              14.87              17.81

   RUN TIME             SECONDS                  505                867                505                867
   AVG. EXH. OXYGEN     PERCENT                  .83                .85               1.10                .81
   CATALYST AVG. TEMP.  DEG. C                   251                461                409                474
   CATALYST MAX. TEMP.  DEG. C                   445                508                585                525
   MEASURED DISTANCE    KM                      5.77               6.16               5.76               6.17
        DFC. WET (DRY)                                 .942 ( .880)                          .905 ( .893)
        DCF. WET (DRY)                                1.000 ( .976)                         1.000 ( .977)
        VOL (SCM)                                             208.8                                207.6
        KM  (MEASURED)                                        11.93                                11.93

COMPOSITE RESULTS                                                                                     3-BAG       (4-BAG)
   TEST NUMBER            135-21       TOTAL FUEL SULFUR   MG/KM   38.93     CARBON DIOXIDE       G/KM      332.9      ( 325.5)
   BAROMETER     MM HG    752.9        AVG. EXH. OXYGEN    PCT       .90     FUEL CONSUMPTION     L/100KM    17.93      ( 17.50)
   HUMIDITY      G/KG      10.9        CATALYST AVG. TEMP. DEG C     417     HYDROCARBONS (THC)   G/KM       1.22      (  1.20)
   TEMPERATURE   DEG C     22.8        CATALYST MAX. TEMP. DEG C     585     CARBON MONOXIDE      G/KM      53.28      ( 51.39)
                                                                             OXIDES OF NITROGEN   G/KM        .28      (   .28)
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                         PVM - 135   SET  VEHICLE EMISSIONS RESULTS - NO AIR INJ. + R.O.I.
                                          PROJECT 11-4771-001

                                            VEHICLE NO.    13              TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL    78 CHEV.MALIBU CAL         TRANSMISSION A3                ACTUAL ROAD LOAD   8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                   GVW  2052 KG(  4523 LBS)       GASOLINE  EM-399

   TEST NUMBER                                135-22               135-23
   TEST CYCLE                                  SET                  HFET
   RUN NUMBER                                   1                    1
   DATE                                      8/23/78              8/23/78                      / /
   ODOMETER                            8779KM(  5455MILES)  8816KM(  5478MILES)
   CVS - BAG CART - DYNAMOMETER              2 - 1 - 3            2 - 1 - 3

   TEMPERATURE DEG. C (DEG. F)             22.2 / 72.0          22.8 / 73.0
   RELATIVE HUMIDITY, PCT                     49.6                 42.9
   BAROMETER, MM HG(IN HG)                752.2 (29.62)        752.2 (29.62)
   RUN TIME, SECONDS                          1367                  766

   BLOWER DIF P MM. H2O(IN. H2O)           749.3 (29.5)         749.3 (29.5)
   BLOWER INLET P MM. H2O(IN. H2O)         749.3 (29.5)         749.3 (29.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)        43.9 (111.0)         43.9 (111.0)
   BLOWER REVOLUTIONS                        112899                61831
   CVS FLOW STD. CU. METRES(SCF)          211.9 (7482.3)       116.1 (4101.7)
   HC  SAMPLE METER/RANGE/PPM              9.7/ 3/   97        48.2/ 2/   48
   HC  BCKGRD METER/RANGE/PPM              1.0/ 3/   10         4.4/ 2/    4
   CO  SAMPLE METER/RANGE/PPM             98.0/ 2/ 2272        49.8/ 3/ 1217
   CO  BCKGRD METER/RANGE/PPM               .9/ 2/   15          .4/ 3/    4
   CO2 SAMPLE METER/RANGE/PCT             89.1/ 3/ 1.55        93.5/ 2/ 1.92
   CO2 BCKGRD METER/RANGE/PCT              4.1/ 3/  .06         1.8/ 2/  .07
   NOX SAMPLE METER/RANGE/PPM             14.7/ 2/   15        19.3/ 2/   19
   NOX BCKGRD METER/RANGE/PPM               .8/ 2/    1          .6/ 2/    1
   HC  CONCENTRATION PPM                       88                   40
   CO  CONCENTRATION PPM                      2155                 1148
   CO2 CONCENTRATION PCT                      1.50                 1.87
   NOX CONCENTRATION PPM                      14.0                 18.4
   HC  MASS GRAMS                            10.77                 2.69
   CO  MASS GRAMS                           530.32               155.24
   CO2 MASS GRAMS                           5807.4               3974.4
   NOX MASS GRAMS                             5.27                 3.80
        DFC. WET (DRY)                   .867 ( .858)         .847 ( .841)
        DCF. WET (DRY)                  1.000 ( .976)        1.000 ( .975)
        VOL (SCM)                           211.9                116.1
        KM  (MEASURED)                      21.76                16.23

   TEST NUMBER,            PVMT             135-22               135-23
   BAROMETER,              MM HG             752.2                752.2
   HUMIDITY,               G/KG                8.4                  7.6
   TEMPERATURE,            DEG C              22.2                 22.8
   TOTAL FUEL SULFUR,      MG/KM             20.06                23.02

   AVG. EXH. OXYGEN,       PCT                 .63                  .51
   CATALYST AVG. TEMP.,    DEG C               532                  608
   CATALYST MAX. TEMP.,    DEG C               668                  669
   CARBON DIOXIDE,         G/KM              266.9                244.9
   FUEL CONSUMPTION,       L/100KM           13.09                11.12

   HYDROCARBONS,           G/KM                .49                  .17
   CARBON MONOXIDE,        G/KM              24.37                 9.56
   OXIDES OF NITROGEN,     G/KM                .24                  .23
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TABLE E-36. TEST 135 EMISSIONS RESULTS

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                         PVM - 135   FTP   VEHICLE EMISSIONS RESULTS - NO AIR INJ. + R.B.I.
                                           PROJECT 11-4771-001

TEST NO.    135-31   RUN   1                      VEHICLE NO.   13                        TEST WEIGHT    1588 KG(  3500 LBS)
VEHICLE MODEL    78 CHEV.MALIBU CAL               DATE    8/24/78                         ACTUAL ROAD LOAD    8.0 KW( 10.7 HP)
ENGINE 5.0 L(305 CID) V-8                         BAG CART NO.  1                         GASOLINE  EM-344
TRANSMISSION A3                                   DYNO NO.      3                         ODOMETER    8840 KM(  5493 MILES)
GVW  2052 KG(  4523 LBS)                          CVS NO.       2

BAROMETER 743.20 MM HG(29.26 IN HG)               DRY BULB TEMP. 21.7 DEG C(71.0 DEG F)
RELATIVE HUMIDITY 56 PCT                          ABS. HUMIDITY  9.3 GM/KG               NOX HUMIDITY CORRECTION FACTOR   .96
BAG RESULTS
  BAG NUMBER                                           1                   2                    3                    4
  DESCRIPTION                                     COLD TRANSIENT       STABILIZED          HOT TRANSIENT         STABILIZED

  BLOWER DIF P MM. H2O(IN. H2O)                   762.0 (30.0)        762.0 (30.0)         762.0 (30.0)         762.0 (30.0)
  BLOWER INLET P MM. H2O(IN. H2O)                 762.0 (30.0)        762.0 (30.0)         762.0 (30.0)         762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)                43.3 (110.0)        43.3 (110.0)         43.3 (110.0)         43.3 (110.0)
  BLOWER REVOLUTIONS                                  40825               69690                40806                69710
  CVS FLOW STD. CU. METRES(SCF)                    76.7 (2709.4)      131.0 (4625.5)        76.7 (2708.7)       131.0 (4626.5)
  HC  SAMPLE METER/RANGE/PPM                     22.8/ 3/  228       12.2/ 3/  122        10.8/ 3/  108        10.8/ 3/  108
  HC  BCKGRD METER/RANGE/PPM                      1.3/ 3/   13        1.4/ 3/   14         1.1/ 3/   11         1.1/ 3/   11
  CO  SAMPLE METER/RANGE/PPM                     71.2/ 2/ 3088       53.4/ 2/ 2640        43.6/ 2/ 2013        48.5/ 2/ 2302
  CO  BCKGRD METER/RANGE/PPM                       .2/ 2/    8         .3/ 2/   11          .2/ 2/    8          .3/ 2/   11
  CO2 SAMPLE METER/RANGE/PCT                     81.1/ 3/ 1.94       53.8/ 3/  .94        64.3/ 3/ 1.25        51.4/ 3/  .89
  CO2 BCKGRD METER/RANGE/PCT                      4.5/ 3/  .07        4.4/ 3/  .08         4.5/ 3/  .07         5.8/ 3/  .08
  NOX SAMPLE METER/RANGE/PPM                     15.6/ 2/   16        5.7/ 2/    6        11.4/ 2/   11         5.7/ 2/    6
  NOX BCKGRD METER/RANGE/PPM                       .3/ 2/    0         .2/ 2/    0          .1/ 2/    0          .1/ 2/    0
  DILUTION FACTOR                                    7.11               11.10                 9.88                11.89

  HC  CONCENTRATION PPM                              217                 109                   98                   98
  CO  CONCENTRATION PPM                             3643                2534                 1981                 2210
  CO2 CONCENTRATION PCT                             1.43                 .87                 1.19                  .82
  NOX CONCENTRATION PPM                             15.3                 5.5                 11.3                  5.6
  HC  MASS GRAMS                                    9.60                8.25                 4.39                 7.90
  CO  MASS GRAMS                                  329.98              386.80               171.56               337.19
  CO2 MASS GRAMS                                  2013.6              2091.8               1668.9               1969.0
  NOX MASS GRAMS                                    2.18                1.38                 1.59                 1.34

  HC  GRAMS/KM                                      1.67                1.35                  .76                 1.21
  CO  GRAMS/KM                                     57.47               63.13                29.89                55.13
  CO2 GRAMS/KM                                     350.7               341.7                290.7                321.9
  NOX GRAMS/KM                                       .37                 .22                  .28                  .22
  FUEL CONSUMPTION BY CB L/100KM                   19.05               14.08                14.92                17.68

  RUN TIME            SECONDS                        506                 866                  505                  867
  AVG. EXH. OXYGEN    PERCENT                        .68                 .94                  .43                  .86
  CATALYST AVG. TEMP. DEG. C                         258                 472                  401                  476
  CATALYST MAX. TEMP. DEG. C                         449                 508                  585                  529
  MEASURED DISTANCE   KM                            5.74                6.12                 5.74                 6.12
      DFC. WET (DRY)                                        .891 ( .881)                             .907 ( .896)
      SCF. WET (DRY)                                       1.000 ( .978)                            1.000 ( .979)
      VOL (SCM)                                                  207.7                                    207.7
      KM  (MEASURED)                                             11.86                                    11.86

COMPOSITE RESULTS
  TEST NUMBER   -      135-31      TOTAL FUEL SULFUR   MG/KM    38.09       CARBON DIOXIDE        G/KM         3-BAG          (4-BAG)
  BAROMETER    MM HG   743.2       AVG. EXH. OXYGEN    PCT        .89       FUEL CONSUMPTION      L/100KM      329.5         ( 323.7)
  HUMIDITY     G/KG      9.3       CATALYST AVG. TEMP. DEG C      423       HYDROCARBONS (THC)    G/KM         17.77         ( 17.36)
  TEMPERATURE  DEG C    21.7       CATALYST MAX. TEMP. DEG C      529       CARBON MONOXIDE       G/KM          1.25         (  1.21)
                                                                            OXIDES OF NITROGEN    G/KM         52.78         ( 50.42)
                                                                                                                 .27         (   .27)


                         PVM - 135   SET   VEHICLE EMISSIONS RESULTS - NO AIR INJ. + R.B.I.
                                           PROJECT 11-4771-001

VEHICLE MODEL    78 CHEV.MALIBU CAL               VEHICLE NO.     13                       TEST WEIGHT    1588 KG(  3500 LBS)
ENGINE 5.0 L(305 CID) V-8                         TRANSMISSION A3                          ACTUAL ROAD LOAD    8.0 KW( 10.7 HP)
                                                  GVW  2052 KG(  4523 LBS)                 GASOLINE  EM-344

  TEST NUMBER                                        135-32                  135-33
  TEST CYCLE                                          SET                     HFET
  RUN NUMBER                                           1                       1
  DATE                                              8/26/78                 8/26/78
  ODOMETER                                      8869KM(  5511MILES)     8906KM(  5534MILES)                          / /
  CVS - BAG CART - DYNAMOMETER                     2 - 1 - 3               2 - 1 - 3

  TEMPERATURE DEG. C (DEG. F)                     24.4 / 76.0             23.9 / 75.0
  RELATIVE HUMIDITY, PCT                             45.0                    47.7
  BAROMETER, MM HG(IN HG)                       743.7 (29.28)           743.7 (29.28)
  RUN TIME, SECONDS                                  1348                     766

  BLOWER DIF P MM. H2O(IN. H2O)                 762.0 (30.0)            762.0 (30.0)
  BLOWER INLET P MM. H2O(IN. H2O)               762.0 (30.0)            762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)              43.3 (110.0)            43.3 (110.0)
  BLOWER REVOLUTIONS                               112921                   61765
  CVS FLOW STD. CU. METRES(SCF)                 211.6 (7473.7)          116.2 (4102.8)
  HC  SAMPLE METER/RANGE/PPM                     9.0/ 3/   90            45.3/ 2/   45
  HC  BCKGRD METER/RANGE/PPM                      .9/ 3/    9             4.3/ 2/    4
  CO  SAMPLE METER/RANGE/PPM                    45.7/ 2/ 2135            47.4/ 3/ 1192
  CO  BCKGRD METER/RANGE/PPM                      .1/ 2/    4              .4/ 3/    4
  CO2 SAMPLE METER/RANGE/PCT                    85.5/ 3/ 1.58            43.3/ 2/ 1.91
  CO2 BCKGRD METER/RANGE/PCT                     3.0/ 3/  .05             1.5/ 2/  .05
  NOX SAMPLE METER/RANGE/PPM                    15.3/ 2/   15            22.3/ 2/   22
  NOX BCKGRD METER/RANGE/PPM                      .4/ 2/    0              .4/ 2/    0
  HC  CONCENTRATION PPM                              82                      37
  CO  CONCENTRATION PPM                             2035                    1081
  CO2 CONCENTRATION PCT                             1.54                    1.87
  NOX CONCENTRATION PPM                             15.0                    22.0
  HC  MASS GRAMS                                   10.03                    2.51
  CO  MASS GRAMS                                  501.59                  146.60
  CO2 MASS GRAMS                                  5484.5                  3072.8
  NOX MASS GRAMS                                    5.64                    4.68
      DFC. WET (DRY)                            .866 ( .854)            .899 ( .891)
      SCF. WET (DRY)                           1.000 ( .977)           1.000 ( .973)
      VOL (SCM)                                     211.6                   116.2
      KM  (MEASURED)                                21.40                   16.28

  TEST NUMBER,          PVMT                       135-32                  135-33
  BAROMETER,            MM HG                       743.7                   743.7
  HUMIDITY,             G/KG                          8.8                     9.0
  TEMPERATURE,          DEG C                        24.4                    23.9
  TOTAL FUEL SULFUR,    MG/KM                       28.02                   23.95

  AVG. EXH. OXYGEN,     PCT                           .59                     .38
  CATALYST AVG. TEMP.,  DEG C                         538                     617
  CATALYST MAX. TEMP.,  DEG C                         670                     678
  CARBON DIOXIDE,       G/KM                        273.3                   244.4
  FUEL CONSUMPTION,     L/100KM                     13.26                   11.08

  HYDROCARBONS,         G/KM                          .46                     .15
  CARBON MONOXIDE,      G/KM                        22.40                    9.04
  OXIDES OF NITROGEN,   G/KM                          .26                     .28
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TABLE E-37. TEST 141 EMISSIONS RESULTS

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                         PVM - 141   FTP   VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                              PROJECT 11-4771-001

TEST NO.   141-11   RUN   1                  VEHICLE NO.      14                 TEST WEIGHT   1814 KG(  4000 LBS)
VEHICLE MODEL    78 FORD GRANADA             DATE     5/26/78                    ACTUAL ROAD LOAD   9.8 KW( 13.2 HP)
ENGINE 4.9 L(302 CID) V-8                    BAG CART NO.  1                     GASOLINE  EM-399
TRANSMISSION A3                              DYNO NO.      3                     ODOMETER    1949 KM(  1211 MILES)
GVW  2113 KG(  4658 LBS)                     CVS NO.       2

BAROMETER 741.17 MM HG(29.18 IN HG)          DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)
RELATIVE HUMIDITY 51 PCT                     ABS. HUMIDITY  9.3 GM/KG            NOX HUMIDITY CORRECTION FACTOR   .96
BAG RESULTS
   BAG NUMBER                                      1                 2                 3                 4
   DESCRIPTION                               COLD TRANSIENT      STABILIZED       HOT TRANSIENT       STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)              762.0 (30.0)      762.0 (30.0)      762.0 (30.0)      762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)            762.0 (30.0)      762.0 (30.0)      762.0 (30.0)      762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)           44.4 (112.0)      43.9 (111.0)      44.4 (112.0)      43.9 (111.0)
   BLOWER REVOLUTIONS                            40616             69513             40502             69569
   CVS FLOW STD. CU. METRES(SCF)               75.9 (2682.3)    130.1 (4594.7)     75.7 (2674.6)    130.2 (4597.9)
   HC  SAMPLE METER/RANGE/PPM                13.9/ 3/  139     25.7/ 2/   26     42.4/ 2/   42     27.1/ 2/   27
   HC  BCKGRD METER/RANGE/PPM                 1.9/ 3/   19     18.4/ 2/   18     19.1/ 2/   19     18.7/ 2/   19
   CO  SAMPLE METER/RANGE/PPM                22.6/ 3/  528     19.9/13/   19     44.2/13/   42     15.5/13/   15
   CO  BCKGRD METER/RANGE/PPM                  .1/ 3/    2      5.5/13/    5      5.0/13/    5      3.6/13/    4
   CO2 SAMPLE METER/RANGE/PCT                89.3/ 3/ 1.66     56.5/ 3/  .99     85.8/ 3/ 1.59     60.6/ 3/ 1.07
   CO2 BCKGRD METER/RANGE/PCT                 4.3/ 3/  .07      3.7/ 3/  .06      3.9/ 3/  .06      3.8/ 3/  .06
   NOX SAMPLE METER/RANGE/PPM                49.4/ 2/   49     24.7/ 2/   25     37.5/ 2/   37     22.6/ 2/   23
   NOX BCKGRD METER/RANGE/PPM                 1.0/ 2/    1       .9/ 2/    1       .9/ 2/    1       .8/ 2/    1
   DILUTION FACTOR                                 7.76             13.48              8.39             12.48

   HC  CONCENTRATION PPM                          122                 9                26                10
   CO  CONCENTRATION PPM                          495                13                36                11
   CO2 CONCENTRATION PCT                         1.61               .94              1.54              1.02
   NOX CONCENTRATION PPM                         48.5              23.9              36.7              21.9
   HC  MASS GRAMS                                5.36               .68              1.12               .74
   CO  MASS GRAMS                               43.73              2.03              3.15              1.68
   CO2 MASS GRAMS                              2233.6            2242.9            2132.9            2430.8
   NOX MASS GRAMS                                6.73              5.67              5.08              5.20

   HC  GRAMS/KM                                   .92               .10               .20               .12
   CO  GRAMS/KM                                  7.48               .33               .55               .28
   CO2 GRAMS/KM                                 382.3             361.9             372.3             399.5
   NOX GRAMS/KM                                  1.15               .92               .89               .85
   FUEL CONSUMPTION BY CB L/100KM               16.99             15.48             15.95             17.09

   RUN TIME             SECONDS                   505               866               504               867
   AVG. EXH. OXYGEN     PERCENT                  4.85              6.00              5.50              5.75
   CATALYST AVG. TEMP.  DEG. C                    436               465               446               511
   CATALYST MAX. TEMP.  DEG. C                    597               500               652               597
   MEASURED DISTANCE    KM                       5.84              6.20              5.73              6.09
        DFC, WET (DRY)                                 .905 ( .896)                       .905 ( .896)
        SCF, WET (DRY)                                1.000 ( .979)                      1.000 ( .978)
        VOL (SCM)                                          206.0                              205.9
        KM  (MEASURED)                                     12.04                              11.82

COMPOSITE RESULTS                                                                               3-BAG          (4-BAG)
   TEST NUMBER           141-11     TOTAL FUEL SULFUR   MG/KM    34.11     CARBON DIOXIDE      G/KM     369.0        ( 380.1)
   BAROMETER     MM HG   741.2      AVG. EXH. OXYGEN    PCT       5.70     FUEL CONSUMPTION    L/100KM   15.98        ( 16.34)
   HUMIDITY      G/KG      9.3      CATALYST AVG. TEMP. DEG C      467     HYDROCARBONS (THC)  G/KM        .30        (   .30)
   TEMPERATURE   DEG C    23.3      CATALYST MAX. TEMP. DEG C      652     CARBON MONOXIDE     G/KM       1.88        (  1.87)
                                                                           OXIDES OF NITROGEN  G/KM        .96        (   .99)
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                         PVM - 141   SET   VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                              PROJECT 11-4771-001

                                             VEHICLE NO.      14                 TEST WEIGHT   1814 KG(  4000 LBS)
VEHICLE MODEL    78 FORD GRANADA             TRANSMISSION A3                     ACTUAL ROAD LOAD   9.8 KW( 13.2 HP)
ENGINE 4.9 L(302 CID) V-8                    GVW  2113 KG(  4658 LBS)            GASOLINE  EM-399

   TEST NUMBER                                141-12                  141-13
   TEST CYCLE                                  SET                     HFET
   RUN NUMBER                                   1                       1
   DATE                                      5/26/78                 5/26/78                  /  /
   ODOMETER                             1979KM(  1230MILES)     2080KM(  1293MILES)
   CVS - BAG CART - DYNAMOMETER             2 - 1 - 3               2 - 1 - 3

   TEMPERATURE DEG. C (DEG. F)             25.0 / 77.0             26.1 / 79.0
   RELATIVE HUMIDITY, PCT                     45.7                    47.0
   BAROMETER, MM HG(IN HG)                740.9 (29.17)           740.9 (29.17)
   RUN TIME, SECONDS                          1397                    766

   BLOWER DIF P MM. H2O(IN. H2O)          762.0 (30.0)            762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)        762.0 (30.0)            762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)       43.3 (110.0)            43.9 (111.0)
   BLOWER REVOLUTIONS                        112119                  61979
   CVS FLOW STD. CU. METRES(SCF)          209.9 (7415.1)          115.0 (4061.8)
   HC  SAMPLE METER/RANGE/PPM             43.0/ 2/   43           45.6/ 2/   46
   HC  BCKGRD METER/RANGE/PPM             26.9/ 2/   27           22.6/ 2/   23
   CO  SAMPLE METER/RANGE/PPM             47.1/13/   45           81.5/13/   81
   CO  BCKGRD METER/RANGE/PPM              2.0/13/    2            1.2/13/    1
   CO2 SAMPLE METER/RANGE/PCT             89.6/ 3/ 1.67           46.2/ 2/ 2.07
   CO2 BCKGRD METER/RANGE/PCT              4.6/ 3/  .07            1.6/ 3/  .02
   NOX SAMPLE METER/RANGE/PPM             50.5/ 2/   50           68.2/ 2/   68
   NOX BCKGRD METER/RANGE/PPM              1.1/ 2/    1            1.3/ 2/    1
   HC  CONCENTRATION PPM                       19                      27
   CO  CONCENTRATION PPM                       41                      76
   CO2 CONCENTRATION PCT                      1.61                    2.05
   NOX CONCENTRATION PPM                      49.5                    67.1
   HC  MASS GRAMS                             2.36                    1.76
   CO  MASS GRAMS                            10.02                   10.12
   CO2 MASS GRAMS                           6182.2                  4317.3
   NOX MASS GRAMS                            18.98                   14.50
        DFC, WET (DRY)                    .878 ( .867)            .844 ( .837)
        SCF, WET (DRY)                   1.000 ( .976)           1.000 ( .972)
        VOL (SCM)                            209.9                   115.0
        KM  (MEASURED)                       21.67                   16.29

   TEST NUMBER,           PVMT              141-12                  141-13
   BAROMETER,             MM HG              740.9                   740.9
   HUMIDITY,              G/KG                 9.2                    10.2
   TEMPERATURE,           DEG C               25.0                    26.1
   TOTAL FUEL SULFUR,     MG/KM              26.19                   24.36

   AVG. EXH. OXYGEN,      PCT                 4.95                    7.20
   CATALYST AVG. TEMP.,   DEG C                593                     599
   CATALYST MAX. TEMP.,   DEG C                635                     639
   CARBON DIOXIDE,        G/KM               285.3                   265.0
   FUEL CONSUMPTION,      L/100KM            12.22                   11.37

   HYDROCARBONS,          G/KM                 .11                     .11
   CARBON MONOXIDE,       G/KM                 .46                     .62
   OXIDES OF NITROGEN,    G/KM                 .88                     .89
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TABLE E-38. TEST 141 EMISSIONS RESULTS

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                PWM - 141   FTP   VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
                                  PROJECT 11-4771-001

TEST NO.   141-21   RUN   1              VEHICLE NO.      19                  TEST WEIGHT    1814 KG(   4000 LBS)
VEHICLE MODEL    78 FORD GRANADA         DATE     5/31/78                     ACTUAL ROAD LOAD    9.8 KW( 13.2 HP)
ENGINE 4.9 L(302 CID) V-8                BAG CART NO.   1                     GASOLINE  EM-344
TRANSMISSION A3                          DYNO NO.       3                     ODOMETER    2338 KM(   1453 MILES)
GVW  2113 KG(   4658 LBS)                CVS NO.        2

BAROMETER 740.16 MM HG(29.14 IN HG)      DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)
RELATIVE HUMIDITY 52 PCT                 ABS. HUMIDITY 10.2 GM/KG
BAG RESULTS                                                                   NOX HUMIDITY CORRECTION FACTOR   .98
   BAG NUMBER                                    1                  2                    3                    4
   DESCRIPTION                           COLD TRANSIENT        STABILIZED          HOT TRANSIENT          STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)         762.0 (30.0)        762.0 (30.0)        762.0 (30.0)         762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)       762.0 (30.0)        762.0 (30.0)        762.0 (30.0)         762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)      43.3 (110.0)        43.3 (110.0)        43.3 (110.0)         43.3 (110.0)
   BLOWER REVOLUTIONS                        40675               69555               40631                69613
   CVS FLOW STD. CU. METRES(SCF)          76.1 (2687.4)      130.1 (4595.0)       76.0 (2684.5)       130.2 (4598.4)
   HC   SAMPLE METER/RANGE/PPM           18.0/ 3/  180       61.2/ 2/   61       69.5/ 2/   69        48.7/ 2/   48
   HC   BCKGRD METER/RANGE/PPM            2.5/ 3/   25       20.8/ 2/   20       22.1/ 2/   22        20.0/ 2/   20
   CO   SAMPLE METER/RANGE/PPM           57.2/ 3/ 1428       43.4/ 3/ 1044       26.4/ 3/  625        33.0/ 3/  776
   CO   BCKGRD METER/RANGE/PPM             .6/ 3/   14         .4/ 3/    9         .6/ 3/   14          .6/ 3/   14
   CO2  SAMPLE METER/RANGE/PCT           88.6/ 3/ 1.65       57.1/ 3/ 1.01       79.4/ 3/ 1.43        54.9/ 4/  .99
   CO2  BCKGRD METER/RANGE/PCT            4.6/ 3/  .07        4.9/ 3/  .08        5.1/ 3/  .08         3.6/ 3/  .06
   NOX  SAMPLE METER/RANGE/PPM           46.4/ 2/   47        9.1/ 2/    9       29.8/ 2/   30        12.4/ 2/   12
   NOX  BCKGRD METER/RANGE/PPM            1.6/ 2/    2        1.3/ 2/    1        1.9/ 2/    1         1.6/ 2/    1
   DILUTION FACTOR                            7.43               12.05                8.73                12.51

   HC   CONCENTRATION PPM                      158                  43                  50                   30
   CO   CONCENTRATION PPM                     1397                 998                 585                  736
   CO2  CONCENTRATION PCT                     1.59                 .99                1.40                  .94
   NOX  CONCENTRATION PPM                     45.5                 7.9                28.6                 11.0
   HC   MASS GRAMS                            6.95                3.20                2.19                 2.28
   CO   MASS GRAMS                          119.37              151.19               51.81               111.55
   CO2  MASS GRAMS                          2212.3              2231.0              1996.0               2237.0
   NOX  MASS GRAMS                            6.51                1.93                4.08                 2.69

   HC   GRAMS/KM                              1.20                 .53                 .38                  .37
   CO   GRAMS/KM                             20.60               24.91                9.02                18.34
   CO2  GRAMS/KM                             381.8               367.6               338.0                368.6
   NOX  GRAMS/KM                              1.12                 .32                 .71                  .44
   FUEL CONSUMPTION BY CB L/100KM            17.04               17.43               15.12                17.01

   RUN TIME              SECONDS               505                 866                 505                  867
   AVG. EXH. OXYGEN      PERCENT              4.80                4.95                5.10                 4.95
   CATALYST AVG. TEMP.   DEG. C                497                 583                 506                  589
   CATALYST MAX. TEMP.   DEG. C                636                 657                 634                  657
   MEASURED DISTANCE     KM                   5.79                6.07                5.74                 6.07
        DFC, WET (DRY)                                .898 ( .884)                            .907 ( .898)
        SCF, WET (DRY)                               1.000 ( .978)                           1.000 ( .979)
        VOL (SCM)                                           206.2                                   206.2
        KM  (MEASURED)                                      11.86                                   11.81

COMPOSITE RESULTS
   TEST NUMBER             141-21     TOTAL FUEL SULFUR   MG/KM    36.17                                       3-BAG      (4-BAG)
   BAROMETER      MM HG     740.2     AVG. EXH. OXYGEN    PCT       4.95     CARBON DIOXIDE       G/KM        362.6     ( 362.9)
   HUMIDITY       G/KG       10.2     CATALYST AVG. TEMP. DEG C      559     FUEL CONSUMPTION     L/100KM     16.88     ( 16.75)
   TEMPERATURE    DEG C      24.4     CATALYST MAX. TEMP. DEG C      657     HYDROCARBONS (THC)   G/KM          .63     (   .56)
                                                                             CARBON MONOXIDE      G/KM        19.08     ( 17.69)
                                                                             OXIDES OF NITROGEN   G/KM          .80     (   .83)
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                PWM - 141   SET   VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
                                  PROJECT 11-4771-001

VEHICLE MODEL    78 FORD GRANADA         VEHICLE NO.      19                  TEST WEIGHT    1814 KG(   4000 LBS)
ENGINE 4.9 L(302 CID) V-8                TRANSMISSION A3                      ACTUAL ROAD LOAD    9.8 KW( 13.2 HP)
                                         GVW  2113 KG(   4658 LBS)            GASOLINE  EM-344

   TEST NUMBER                               141-22                 141-23
   TEST CYCLE                                 SET                    HFET
   RUN NUMBER                                  1                      1
   DATE                                     5/31/78                5/31/78
   ODOMETER                            2367KM(  1471MILES)    2227KM(  1384MILES)
   CVS - BAG CART - DYNAMOMETER            2 - 1 - 3              2 - 1 - 3

   TEMPERATURE DEG. C (DEG. F)           24.4 / 76.0            23.3 / 74.0
   RELATIVE HUMIDITY, PCT                   45.1                   59.4
   BAROMETER, MM HG(IN HG)              739.6 (29.12)          739.6 (29.12)
   RUN TIME, SECONDS                        1398                    765

   BLOWER DIF P MM. H2O(IN. H2O)        762.0 (30.0)           762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)      762.0 (30.0)           762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)     43.3 (110.0)           43.9 (111.0)
   BLOWER REVOLUTIONS                       112845                 61753
   CVS FLOW STD. CU. METRES(SCF)        209.9 (7412.4)         115.3 (4073.6)
   HC   SAMPLE METER/RANGE/PPM          41.9/ 2/   42          53.5/ 2/   53
   HC   BCKGRD METER/RANGE/PPM          17.3/ 2/   17          17.7/ 2/   18
   CO   SAMPLE METER/RANGE/PPM          80.7/11/  371          58.6/11/  233
   CO   BCKGRD METER/RANGE/PPM            .9/11/    3            .5/11/    2
   CO2  SAMPLE METER/RANGE/PCT          91.2/ 3/ 1.70          96.2/ 2/ 2.07
   CO2  BCKGRD METER/RANGE/PCT           4.3/ 3/  .07           1.8/ 2/  .07
   NOX  SAMPLE METER/RANGE/PPM          39.7/ 2/   40          66.0/ 2/   66
   NOX  BCKGRD METER/RANGE/PPM           1.4/ 2/    1           1.3/ 2/    1
   HC   CONCENTRATION PPM                    27                     39
   CO   CONCENTRATION PPM                   351                    218
   CO2  CONCENTRATION PCT                  1.65                   2.02
   NOX  CONCENTRATION PPM                  38.5                   64.9
   HC   MASS GRAMS                         3.25                   2.57
   CO   MASS GRAMS                        85.85                  29.28
   CO2  MASS GRAMS                       6326.3                 4257.3
   NOX  MASS GRAMS                        14.55                  13.99
        DFC, WET (DRY)                .870 ( .863)           .893 ( .830)
        SCF, WET (DRY)               1.000 ( .976)          1.000 ( .970)
        VOL (SCM)                         209.9                  115.3
        KM  (MEASURED)                    21.77                  16.40

   TEST NUMBER,           PVNT             141-22                 141-23
   BAROMETER,             MM HG             739.6                  739.6
   HUMIDITY,              G/KG                8.8                   10.0
   TEMPERATURE,           DEG C              24.4                   23.3
   TOTAL FUEL SULFUR,     MG/KM             27.14                  29.05

   AVG. EXH. OXYGEN,      PCT                3.90                   3.35
   CATALYST AVG. TEMP.,   DEG C               584                    597
   CATALYST MAX. TEMP.,   DEG C               694                    639
   CARBON DIOXIDE,        G/KM              290.6                  259.7
   FUEL CONSUMPTION,      L/100KM           12.69                  11.22

   HYDROCARBONS,          G/KM                .15                    .16
   CARBON MONOXIDE,       G/KM               3.94                   1.79
   OXIDES OF NITROGEN,    G/KM                .67                    .85
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TABLE E-39. TEST 141 EMISSIONS RESULTS

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                 PVH - 141   FTP  VEHICLE EMISSIONS RESULTS - HIGH HEST 10LK
                                  PROJECT 11-4771-001

TEST NO.   141-31   RUN   1                 VEHICLE NO.      19              TEST WEIGHT   1814 KG(  4000 LBS)
VEHICLE MODEL   78 FORD GRANADA             DATE    6/ 2/78                  ACTUAL ROAD LOAD   9.8 KW( 13.2 HP)
ENGINE 4.9 L(302 CID) V-8                   BAG CART NO.  1                  GASOLINE  EM-399
TRANSMISSION A3                             DYNO NO.      3                  ODOMETER   2417 KM(  1502 MILES)
GVW  2113 KG(  4658 LBS)                    CVS NO.       2

BAROMETER 739.90 MM HG(29.13 IN HG)         DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)
RELATIVE HUMIDITY 59 PCT                    ABS. HUMIDITY 11.2 GM/KG          NOX HUMIDITY CORRECTION FACTOR  1.01
BAG RESULTS
  BAG NUMBER                                       1                  2                  3                  4
  DESCRIPTION                               COLD TRANSIENT       STABILIZED        HOT TRANSIENT       STABILIZED

  BLOWER DIF P MM. H2O(IN. H2O)              762.0 (30.0)      762.0 (30.0)      762.0 (30.0)      762.0 (30.0)
  BLOWER INLET P MM. H2O(IN. H2O)            762.0 (30.0)      762.0 (30.0)      762.0 (30.0)      762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)           43.3 (110.0)      42.8 (109.0)      43.3 (110.0)      43.3 (110.0)
  BLOWER REVOLUTIONS                            40842             69506             40599             69576
  CVS FLOW STD. CU. METRES(SCF)              76.0 (2684.2)    130.2 (4599.0)     75.8 (2677.6)    130.0 (4591.2)
  HC  SAMPLE METER/RANGE/PPM                17.2/ 3/  172     52.3/ 2/   52     64.2/ 2/   64     46.8/ 2/   47
  HC  BCKGRD METER/RANGE/PPM                 1.7/ 3/   17     14.7/ 2/   15     13.4/ 2/   13     13.0/ 2/   13
  CO  SAMPLE METER/RANGE/PPM                55.7/ 3/ 1384     42.8/ 3/ 1020     31.1/ 3/  720     38.5/ 3/  916
  CO  BCKGRD METER/RANGE/PPM                  .1/ 3/    2       .2/ 3/    5       .2/ 3/    5       .2/ 3/    5
  CO2 SAMPLE METER/RANGE/PCT                43.8/ 3/ 1.76     58.8/ 3/ 1.04     78.5/ 3/ 1.44     55.4/ 3/  .98
  CO2 BCKGRD METER/RANGE/PCT                 4.5/ 3/  .07      4.5/ 3/  .07      3.5/ 3/  .05      3.9/ 3/  .06
  NOX SAMPLE METER/RANGE/PPM                55.0/ 2/   55      8.1/ 2/    8     25.7/ 2/   26      9.1/ 2/    9
  NOX BCKGRD METER/RANGE/PPM                 1.5/ 2/    2       .8/ 2/    1       .9/ 2/    1       .7/ 2/    1
  DILUTION FACTOR                                7.03             11.74              8.85             12.99

  HC  CONCENTRATION PPM                          157                39                52                35
  CO  CONCENTRATION PPM                         1309               984               691               877
  CO2 CONCENTRATION PCT                         1.70               .98              1.39               .93
  NOX CONCENTRATION PPM                         53.7               7.4              24.9               8.7
  HC  MASS GRAMS                                6.90              2.92              2.29              2.61
  CO  MASS GRAMS                              115.88            149.21             60.96            132.73
  CO2 MASS GRAMS                              2369.1            2327.5            1941.2            2210.0
  NOX MASS GRAMS                                7.92              1.86              3.66              2.18

  HC  GRAMS/KM                                  1.20               .48               .41               .43
  CO  GRAMS/KM                                 20.20             24.36             10.75             21.75
  CO2 GRAMS/KM                                 412.2             380.0             342.1             363.5
  NOX GRAMS/KM                                  1.38               .30               .65               .36
  FUEL CONSUMPTION BY CB L/100KM               19.11             17.98             15.38             17.03

  RUN TIME             SECONDS                   505               866               505               866
  AVG. EXH. OXYGEN     PERCENT                  4.30              4.35              4.85              4.45
  CATALYST AVG. TEMP.  DEG. C                    433               602               516               587
  CATALYST MAX. TEMP.  DEG. C                    652               666               619               698
  MEASURED DISTANCE    KM                       5.74              6.13              5.67              6.10
       DFC, WET (DRY)                                 .899 ( .883)                         .908 ( .896)
       SCF, WET (DRY)                                1.000 ( .975)                        1.000 ( .977)
       VOL (SCM)                                        206.2                                205.8
       KM  (MEASURED)                                   11.86                                11.75

COMPOSITE RESULTS                                                                                   3-BAG        (4-BAG)
  TEST NUMBER            141-31      TOTAL FUEL SULFUR   MG/KM   37.99     CARBON DIOXIDE      G/KM      376.3      ( 371.9)
  BAROMETER      MM HG  739.9        AVG. EXH. OXYGEN    PCT      4.45     FUEL CONSUMPTION    L/100KM   17.97      ( 17.21)
  HUMIDITY       G/KG    11.2        CATALYST AVG. TEMP. DEG C     557     HYDROCARBONS (THC)  G/KM        .61      (   .59)
  TEMPERATURE    DEG C   23.9        CATALYST MAX. TEMP. DEG C     666     CARBON MONOXIDE     G/KM      19.79      ( 19.01)
                                                                           OXIDES OF NITROGEN  G/KM        .68      (   .69)
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                 PVH - 141   SET  VEHICLE EMISSIONS RESULTS - HIGH HEST 10LK
                                  PROJECT 11-4771-001

                                            VEHICLE NO.      19                TEST WEIGHT   1814 KG(  4000 LBS)
VEHICLE MODEL   78 FORD GRANADA             TRANSMISSION A3                    ACTUAL ROAD LOAD   9.8 KW( 13.2 HP)
ENGINE 4.9 L(302 CID) V-8                   GVW  2113 KG(  4658 LBS)           GASOLINE  EM-399

  TEST NUMBER                                  141-32               141-33
  TEST CYCLE                                    SET                  HFET
  RUN NUMBER                                     1                    2
  DATE                                        6/ 2/78              6/ 6/78
  ODOMETER                               2446KM(  1520MILES)   2562KM(  1592MILES)
  CVS - BAG CART - DYNAMOMETER               2 - 1 - 3            2 - 1 - 3

  TEMPERATURE DEG. C (DEG. F)               23.3 / 74.0          25.6 / 78.0
  RELATIVE HUMIDITY, PCT                       58.1                 53.2
  BAROMETER, MM HG(IN HG)                  739.4 (29.11)        733.6 (28.88)
  RUN TIME, SECONDS                            1388                  765

  BLOWER DIF P MM. H2O(IN. H2O)             762.0 (30.0)         762.0 (30.0)
  BLOWER INLET P MM. H2O(IN. H2O)           762.0 (30.0)         762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)          43.3 (110.0)         43.9 (111.0)
  BLOWER REVOLUTIONS                          111310                61595
  CVS FLOW STD. CU. METRES(SCF)            207.9 (7344.7)       113.9 (4022.3)
  HC  SAMPLE METER/RANGE/PPM               40.3/ 2/   40        48.6/ 2/   49
  HC  BCKGRD METER/RANGE/PPM               11.9/ 2/   12        18.7/ 2/   19
  CO  SAMPLE METER/RANGE/PPM               87.2/11/  402        77.2/12/  177
  CO  BCKGRD METER/RANGE/PPM                 .7/11/    2         2.3/12/    4
  CO2 SAMPLE METER/RANGE/PCT               59.6/ 3/ 1.67        49.5/ 2/ 1.98
  CO2 BCKGRD METER/RANGE/PCT                3.7/ 3/  .06         1.6/ 2/  .06
  NOX SAMPLE METER/RANGE/PPM               37.7/ 2/   38        61.8/ 2/   62
  NOX BCKGRD METER/RANGE/PPM                 .5/ 2/    1         1.3/ 2/    1
  HC  CONCENTRATION PPM                         30                   33
  CO  CONCENTRATION PPM                        390                  169
  CO2 CONCENTRATION PCT                        1.62                 1.93
  NOX CONCENTRATION PPM                        37.3                 60.7
  HC  MASS GRAMS                               3.59                 2.15
  CO  MASS GRAMS                              96.96                21.79
  CO2 MASS GRAMS                             6170.7               4082.6
  NOX MASS GRAMS                              19.81                13.97
       DFC, WET (DRY)                      .872 ( .861)         .851 ( .842)
       SCF, WET (DRY)                     1.000 ( .972)        1.000 ( .971)
       VOL (SCM)                              207.9                113.9
       KM  (MEASURED)                         21.39                16.33

  TEST NUMBER,          PVMT                 141-32               141-33
  BAROMETER,            MM HG                739.4                733.6
  HUMIDITY,             G/KG                  10.7                 11.3
  TEMPERATURE,          DEG C                 23.3                 25.6
  TOTAL FUEL SULFUR,    MG/KM                27.17                22.76

  AVG. EXH. OXYGEN,     PCT                   3.70                 1.15
  CATALYST AVG. TEMP.,  DEG C                  569                  552
  CATALYST MAX. TEMP.,  DEG C                  657                  636
  CARBON DIOXIDE,       G/KM                 288.5                250.3
  FUEL CONSUMPTION,     L/100KM              12.66                10.62

  HYDROCARBONS,         G/KM                   .17                  .13
  CARBON MONOXIDE,      G/KM                  4.52                 1.33
  OXIDES OF NITROGEN,   G/KM                   .93                  .86
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TABLE E-40. TEST 142 EMISSIONS RESULTS

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                    PVM - 142   FTP   VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                      PROJECT 11-4771-001

TEST NO.    142-11   RUN   1
VEHICLE MODEL    78 FORD GRANADA             VEHICLE NO.   19                     TEST WEIGHT   1814 KG(  4000 LBS)
ENGINE 4.9 L(302 CID) V-8                    DATE    8/ 8/78                      ACTUAL ROAD LOAD    9.8 KW( 13.2 HP)
TRANSMISSION A3                              BAG CART NO.  1                      GASOLINE  EM-344
GVW  2113 KG(  4658 LBS)                     DYNO NO.      3                      ODOMETER    6600 KM(  4101 MILES)
                                             CVS NO.       2
BAROMETER 743.46 MM HG(29.27 IN HG)
RELATIVE HUMIDITY 61 PCT                     DRY BULB TEMP. 22.8 DEG C(73.0 DEG F)
BAG RESULTS                                  ABS. HUMIDITY 10.9 GM/KG
  BAG NUMBER                                                                      NOX HUMIDITY CORRECTION FACTOR  1.00
  DESCRIPTION
                                                   1                  2                   3                  4
                                             COLD TRANSIENT       STABILIZED         HOT TRANSIENT       STABILIZED

  BLOWER DIF P MM. H2O(IN. H2O)              774.7 (30.5)       774.7 (30.5)       774.7 (30.5)       774.7 (30.5)
  BLOWER INLET P MM. H2O(IN. H2O)            774.7 (30.5)       774.7 (30.5)       774.7 (30.5)       774.7 (30.5)
  BLOWER INLET TEMP. DEG. C(DEG. F)           43.3 (110.0)       43.3 (110.0)       43.3 (110.0)       43.3 (110.0)
  BLOWER REVOLUTIONS                            40648              69600              40741              69547
  CVS FLOW STD. CU. METRES(SCF)              76.4 (2697.3)      130.6 (4612.3)      76.5 (2700.2)     130.6 (4612.4)
  HC  SAMPLE METER/RANGE/PPM                 11.0/ 3/  110      17.9/ 2/   17      30.2/ 2/   30      16.9/ 2/   16
  HC  BCKGRD METER/RANGE/PPM                  1.0/ 3/   10      11.0/ 2/   11       9.7/ 2/   10       9.9/ 2/   10
  CO  SAMPLE METER/RANGE/PPM                 17.0/ 3/  389      12.9/13/   12      12.6/13/   12       9.3/13/    9
  CO  BCKGRD METER/RANGE/PPM                   .8/ 3/   18       4.6/13/    4       6.3/13/    6       5.6/13/    5
  CO2 SAMPLE METER/RANGE/PCT                 86.1/ 3/ 1.60      56.0/ 3/ 1.00      69.9/ 3/ 1.26      56.6/ 3/  .99
  CO2 BCKGRD METER/RANGE/PCT                  3.5/ 3/  .05       4.2/ 3/  .06       3.5/ 3/  .05       3.0/ 3/  .06
  NOX SAMPLE METER/RANGE/PPM                 60.8/ 2/   61      32.3/ 2/   32      40.3/ 2/   40      31.8/ 2/   31
  NOX BCKGRD METER/RANGE/PPM                  1.3/ 2/    1        .9/ 2/    1        .9/ 2/    1        .9/ 2/    1
  DILUTION FACTOR                               8.15               13.37              10.58              13.95

  HC  CONCENTRATION PPM                          101                  7                 21                  7
  CO  CONCENTRATION PPM                          354                  3                  6                  4
  CO2 CONCENTRATION PCT                         1.55                .94               1.21                .94
  NOX CONCENTRATION PPM                         59.7               31.5               29.5               30.5
  HC  MASS GRAMS                                9.46                .89                .94                .59
  CO  MASS GRAMS                               31.99                .58                .59                .56
  CO2 MASS GRAMS                              2167.1             2247.9             1694.1             2247.9
  NOX MASS GRAMS                                8.76               7.90               5.60               7.65

  HC  GRAMS/KM                                   .77                .09                .16                .09
  CO  GRAMS/KM                                  5.45                .08                .09                .09
  CO2 GRAMS/KM                                 379.8              365.1              243.6              363.9
  NOX GRAMS/KM                                  1.51               1.28               1.00               1.29
  FUEL CONSUMPTION BY CB L/100KM               16.47              15.60              14.56              15.55

  RUN TIME               SECONDS                 505                866                505                866
  AVG. EXH. OXYGEN       PERCENT                3.99               5.35               4.62               5.70
  CATALYST AVG. TEMP.    DEG. C                  319                392                351                390
  CATALYST MAX. TEMP.    DEG. C                  461                461                457                457
  MEASURED DISTANCE      KM                     5.78               6.16               5.74               6.17
      DFC, WET (DRY)                                  .908 ( .895)                          .918 ( .906)
      SCF, WET (DRY)                                 1.080 ( .975)                         1.080 ( .977)
      VOL (SCM)                                            207.0                                 207.0
      KM  (MEASURED)                                       11.94                                 11.96

COMPOSITE RESULTS
  TEST NUMBER             142-11
  BAROMETER     MM HG     743.5      TOTAL FUEL SULFUR   MG/KM    32.02       CARBON DIOXIDE        G/KM       3-BAG      (4-BAG)
  HUMIDITY      G/KG       10.9      AVG. EXH. OXYGEN    PCT       4.90       FUEL CONSUMPTION      L/100KM    397.4      ( 397.1)
  TEMPERATURE   DEG C      22.8      CATALYST AVG. TEMP. DEG C      371       HYDROCARBONS (THC)    G/KM       16.94      ( 16.93)
                                     CATALYST MAX. TEMP. DEG C      461       CARBON MONOXIDE       G/KM         .25      (   .25)
                                                                              OXIDES OF NITROGEN    G/KM        1.20      (  1.21)
                                                                                                                1.25      (  1.24)
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                    PVM - 142   SET   VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                      PROJECT 11-4771-001

VEHICLE MODEL    78 FORD GRANADA             VEHICLE NO.    19                    TEST WEIGHT   1814 KG(  4000 LBS)
ENGINE 4.9 L(302 CID) V-8                    TRANSMISSION A3                      ACTUAL ROAD LOAD    9.8 KW( 13.2 HP)
                                             GVW  2113 KG(  4658 LBS)             GASOLINE  EM-344
  TEST NUMBER
  TEST CYCLE                                    142-12                 142-13
  RUN NUMBER                                     SET                    HFET
  DATE                                            1                      1
  ODOMETER                                      8/ 8/78                8/ 8/78
  CVS - BAG CART - DYNAMOMETER               6629KM(  4119MILES)    6666KM(  4142MILES)          /  /
                                                2 - 1 - 3              2 - 1 - 3
  TEMPERATURE DEG. C (DEG. F)
  RELATIVE HUMIDITY, PCT                       23.9 / 75.0            24.4 / 76.0
  BAROMETER, MM HG(IN HG)                         47.7                   41.6
  RUN TIME, SECONDS                           743.7 (29.28)          743.7 (29.28)
                                                  1397                    766
  BLOWER DIF P MM. H2O(IN. H2O)
  BLOWER INLET P MM. H2O(IN. H2O)              774.7 (30.5)           774.7 (30.5)
  BLOWER INLET TEMP. DEG. C(DEG. F)            774.7 (30.5)           774.7 (30.5)
  BLOWER REVOLUTIONS                            43.3 (110.0)           43.3 (110.0)
  CVS FLOW STD. CU. METRES(SCF)                  112125                 61550
  HC  SAMPLE METER/RANGE/PPM                  210.9 (7432.7)         115.5 (4080.3)
  HC  BCKGRD METER/RANGE/PPM                  22.8/ 2/   23          23.8/ 2/   24
  CO  SAMPLE METER/RANGE/PPM                   9.3/ 2/    9           9.5/ 2/   10
  CO  BCKGRD METER/RANGE/PPM                  29.6/13/   27          25.4/13/   23
  CO2 SAMPLE METER/RANGE/PCT                   4.1/13/    4           4.4/13/    4
  CO2 BCKGRD METER/RANGE/PCT                  85.4/ 3/ 1.54          42.7/ 2/ 1.88
  NOX SAMPLE METER/RANGE/PPM                   3.0/ 3/  .05           1.8/ 2/  .07
  NOX BCKGRD METER/RANGE/PPM                  53.7/ 2/   54          62.8/ 2/   63
  HC  CONCENTRATION PPM                        1.0/ 2/    1           1.3/ 2/    1
  CO  CONCENTRATION PPM                            15                     16
  CO2 CONCENTRATION PCT                            22                     19
  NOX CONCENTRATION PPM                           1.55                   1.03
  HC  MASS GRAMS                                  52.8                   61.7
  CO  MASS GRAMS                                  1.77                   1.09
  CO2 MASS GRAMS                                  5.41                   2.44
  NOX MASS GRAMS                                5981.2                 3862.3
      DFC, WET (DRY)                             20.13                  12.55
      SCF, WET (DRY)                          .881 ( .873)           .859 ( .853)
      VOL (SCM)                              1.000 ( .976)          1.000 ( .976)
      KM  (MEASURED)                             210.9                  115.5
                                                 21.61                  16.22
  TEST NUMBER,             PVMT
  BAROMETER,               MM HG                142-12                 142-13
  HUMIDITY,                G/KG                  743.7                  743.7
  TEMPERATURE,             DEG C                   9.0                    8.1
  TOTAL FUEL SULFUR,       MG/KM                  23.9                   24.4
                                                 25.30                  21.82
  AVG. EXH. OXYGEN,        PCT
  CATALYST AVG. TEMP.,     DEG C                  4.35                   3.24
  CATALYST MAX. TEMP.,     DEG C                   448                    487
  CARBON DIOXIDE,          G/KM                    533                    530
  FUEL CONSUMPTION,        L/100KM               276.8                  230.1
                                                 11.84                  10.18
  HYDROCARBONS,            G/KM
  CARBON MONOXIDE,         G/KM                    .08                    .06
  OXIDES OF NITROGEN,      G/KM                    .25                    .15
                                                   .93                    .77
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TABLE E-41. TEST 142 EMISSIONS RESULTS

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                     PVN - 142   FTP   VEHICLE EMISSIONS RESULTS - IGNITION MISFIRE
                                       PROJECT 11-4771-001

TEST NO.   142-21   RUN   1                 VEHICLE NO.   19                  TEST WEIGHT   1814 KG(  4000 LBS)
VEHICLE MODEL    78 FORD GRANADA            DATE    8/19/78                   ACTUAL ROAD LOAD   9.8 KW( 13.2 HP)
ENGINE 4.9 L(302 CID) V-8                   BAG CART NO.  1                   GASOLINE  EM-399
TRANSMISSION A3                             DYNO NO.      3                   ODOMETER   7005 KM(  4353 MILES)
GVW  2113 KG(  4658 LBS)                    CVS NO.       2

BAROMETER 741.68 MM HG(29.20 IN HG)         DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)
RELATIVE HUMIDITY 65 PCT                    ABS. HUMIDITY 11.1 GM/KG          NOX HUMIDITY CORRECTION FACTOR  1.01
BAG RESULTS
   BAG NUMBER                                    1                  2                  3                  4
   DESCRIPTION                            COLD TRANSIENT       STABILIZED       HOT TRANSIENT        STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)           749.3 (29.5)       749.3 (29.5)       749.3 (29.5)       749.3 (29.5)
   BLOWER INLET P MM. H2O(IN. H2O)         749.3 (29.5)       749.3 (29.5)       749.3 (29.5)       749.3 (29.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)        42.8 (109.0)       42.8 (109.0)       43.3 (110.0)       43.3 (110.0)
   BLOWER REVOLUTIONS                          40669              69799              40778              69669
   CVS FLOW STD. CU. METRES(SCF)           76.5 (2700.5)     131.2 (4633.7)      76.6 (2705.5)     130.9 (4621.7)
   HC  SAMPLE METER/RANGE/PPM             71.9/ 3/  719      40.9/ 2/   40      14.7/ 3/  147      39.9/ 2/   39
   HC  BCKGRD METER/RANGE/PPM              1.5/ 3/   15      11.9/ 2/   12       1.1/ 3/   11      11.9/ 2/   11
   CO  SAMPLE METER/RANGE/PPM             27.1/ 3/  630      19.9/13/   19      41.7/13/   36      12.0/13/   12
   CO  BCKGRD METER/RANGE/PPM              1.0/ 3/   23      15.5/13/   15       9.5/13/    9       7.2/13/    7
   CO2 SAMPLE METER/RANGE/PCT             87.9/ 3/ 1.63      59.2/ 3/ 1.05      79.7/ 3/ 1.46      59.0/ 3/ 1.04
   CO2 BCKGRD METER/RANGE/PCT              4.5/ 3/  .07       4.2/ 3/  .06       4.2/ 3/  .06       5.8/ 3/  .09
   NOX SAMPLE METER/RANGE/PPM             69.0/ 2/   69      44.8/ 2/   45      58.6/ 2/   59      44.6/ 2/   45
   NOX BCKGRD METER/RANGE/PPM              2.3/ 2/    2       1.7/ 2/    2       2.0/ 2/    2       1.6/ 2/    2
   DILUTION FACTOR                              7.59              12.73               9.09              12.78

   HC  CONCENTRATION PPM                         701                 29                137                 29
   CO  CONCENTRATION PPM                         578                  5                 26                  5
   CO2 CONCENTRATION PCT                        1.57                .99               1.41                .96
   NOX CONCENTRATION PPM                        67.0               43.2               56.8               43.0
   HC  MASS GRAMS                              30.91               2.23               6.06               2.18
   CO  MASS GRAMS                              51.96                .70               2.36                .82
   CO2 MASS GRAMS                             2209.2             2373.4             1972.5             2301.9
   NOX MASS GRAMS                               9.94              11.00               8.44              10.92

   HC  GRAMS/KM                                 5.36                .36               1.05                .35
   CO  GRAMS/KM                                 9.01                .11                .41                .13
   CO2 GRAMS/KM                                382.3              382.9              340.6              372.6
   NOX GRAMS/KM                                 1.72               1.77               1.46               1.77
   FUEL CONSUMPTION BY CB L/100KM              17.69              16.40              14.70              15.96

   RUN TIME                SECONDS               509                867                506                866
   AVG. EXH. OXYGEN        PERCENT              4.29               5.21               4.52               5.55
   CATALYST AVG. TEMP.     DEG. C                390                538                487                533
   CATALYST MAX. TEMP.     DEG. C                610                597                606                597
   MEASURED DISTANCE       KM                   5.77               6.20               5.79               6.18
        DFC, WET (DRY)                                 .902 ( .889)                          .910 ( .897)
        SCF, WET (DRY)                                1.000 ( .979)                         1.000 ( .979)
        VOL (SCM)                                          207.7                                 207.5
        KM  (MEASURED)                                     11.96                                 11.97

COMPOSITE RESULTS                                                                                         3-BAG      (4-BAG)
   TEST NUMBER              142-21     TOTAL FUEL SULFUR    MG/KM   34.70      CARBON DIOXIDE        G/KM      371.1     ( 368.1)
   BAROMETER     MM HG       741.7     AVG. EXH. OXYGEN     PCT      4.91      FUEL CONSUMPTION      L/100KM    16.19     ( 16.06)
   HUMIDITY      G/KG         11.1     CATALYST AVG. TEMP. DEG C      509      HYDROCARBONS (THC)    G/KM        1.59     (  1.58)
   TEMPERATURE   DEG C        22.2     CATALYST MAX. TEMP. DEG C      610      CARBON MONOXIDE       G/KM        2.02     (  2.03)


                     PVN - 142   SET   VEHICLE EMISSIONS RESULTS - IGNITION MISFIRE
                                       PROJECT 11-4771-001

                                            VEHICLE NO.      19               TEST WEIGHT   1814 KG(  4000 LBS)
VEHICLE MODEL    78 FORD GRANADA            TRANSMISSION A3                   ACTUAL ROAD LOAD   9.8 KW( 13.2 HP)
ENGINE 4.9 L(302 CID) V-8                   GVW  2113 KG(  4658 LBS)          GASOLINE  EM-399

   TEST NUMBER                                142-22                 142-23
   TEST CYCLE                                   SET                   HFET
   RUN NUMBER                                    1                     1
   DATE                                       8/19/78               8/19/78                      /  /
   ODOMETER                             7034KM(  4371MILES)   7071KM(  4394MILES)
   CVS - BAG CART - DYNAMOMETER              2 - 1 - 3             2 - 1 - 3

   TEMPERATURE DEG. C (DEG. F)              22.2 / 72.0           23.9 / 75.0
   RELATIVE HUMIDITY, PCT                      53.1                  51.3
   BAROMETER, MM HG(IN HG)                 742.7 (29.24)         742.7 (29.24)
   RUN TIME, SECONDS                           1397                   765

   BLOWER DIF P MM. H2O(IN. H2O)           749.3 (29.5)          749.3 (29.5)
   BLOWER INLET P MM. H2O(IN. H2O)         749.3 (29.5)          749.3 (29.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)        43.3 (110.0)          43.3 (110.0)
   BLOWER REVOLUTIONS                         112194                 61990
   CVS FLOW STD. CU. METRES(SCF)          211.0 (7453.6)        115.7 (4085.2)
   HC  SAMPLE METER/RANGE/PPM             99.6/ 2/  100         10.5/ 3/  105
   HC  BCKGRD METER/RANGE/PPM             11.0/ 2/   11          1.2/ 3/   12
   CO  SAMPLE METER/RANGE/PPM             59.3/13/   48         47.0/13/   40
   CO  BCKGRD METER/RANGE/PPM              4.1/13/    4          2.3/13/    2
   CO2 SAMPLE METER/RANGE/PCT             90.8/ 3/ 1.70         45.1/ 2/ 2.01
   CO2 BCKGRD METER/RANGE/PCT              4.7/ 3/  .07          1.6/ 2/  .06
   NOX SAMPLE METER/RANGE/PPM             66.9/ 2/   67         76.9/ 2/   77
   NOX BCKGRD METER/RANGE/PPM              1.6/ 2/    2          2.0/ 2/    2
   HC  CONCENTRATION PPM                        90                    95
   CO  CONCENTRATION PPM                        42                    36
   CO2 CONCENTRATION PCT                      1.63                  1.96
   NOX CONCENTRATION PPM                      65.5                  75.2
   HC  MASS GRAMS                            10.95                  6.33
   CO  MASS GRAMS                            10.39                  4.84
   CO2 MASS GRAMS                           6306.9                4159.6
   NOX MASS GRAMS                            25.09                 16.10
        DFC, WET (DRY)                   .872 ( .863)          .849 ( .840)
        SCF, WET (DRY)                  1.000 ( .979)         1.000 ( .971)
        VOL (SCM)                            211.0                 115.7
        KM  (MEASURED)                       21.54                 16.34

   TEST NUMBER,            PVNT             142-22                142-23
   BAROMETER,              MM HG             742.7                 742.7
   HUMIDITY,               G/KG                9.1                   9.3
   TEMPERATURE,            DEG C              22.2                  23.9
   TOTAL FUEL SULFUR,      MG/KM             27.00                 23.42

   AVG. EXH. OXYGEN,       PCT                4.19                  3.15
   CATALYST AVG. TEMP.,    DEG C               594                   633
   CATALYST MAX. TEMP.,    DEG C               691                   695
   CARBON DIOXIDE,         G/KM              292.8                 254.3
   FUEL CONSUMPTION,       L/100KM           12.60                 10.93

   HYDROCARBONS,           G/KM                .51                   .39
   CARBON MONOXIDE,        G/KM                .48                   .30
   OXIDES OF NITROGEN,     G/KM               1.16                   .99
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TABLE E-42. TEST 142 EMISSIONS RESULTS

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                        PVM - 142   FTP  VEHICLE EMISSIONS RESULTS - IGNITION MISFIRE
                                         PROJECT 11-4771-001

TEST NO.   142-31   RUN   1
VEHICLE MODEL    78 FORD GRANADA          VEHICLE NO.   14                          TEST WEIGHT   1814 KG(  4000 LBS)
ENGINE 4.9 L(302 CID) V-8                 DATE    8/15/78                           ACTUAL ROAD LOAD   9.8 KW( 13.2 HP)
TRANSMISSION A3                           BAG CART NO.  1                           GASOLINE  EM-344
GVW  2113 KG(  4658 LBS)                  DYNO NO.      3                           ODOMETER   7089 KM(  4405 MILES)
                                          CVS NO.       2
BAROMETER 742.44 MM HG(29.23 IN HG)
RELATIVE HUMIDITY 65 PCT                  DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)
BAG RESULTS                               ABS. HUMIDITY 11.1 GM/KG
   BAG NUMBER                                                                       NOX HUMIDITY CORRECTION FACTOR  1.01
   DESCRIPTION
                                               1                  2                   3                    4
                                          COLD TRANSIENT      STABILIZED         HOT TRANSIENT         STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)          762.0 (30.0)       762.0 (30.0)       762.0 (30.0)         762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)        762.0 (30.0)       762.0 (30.0)       762.0 (30.0)         762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)       43.3 (110.0)       43.3 (110.0)       43.3 (110.0)         43.3 (110.0)
   BLOWER REVOLUTIONS                        40734              69715              40623                69664
   CVS FLOW STD. CU. METRES(SCF)           76.5 (2700.5)     130.8 (4621.5)      76.2 (2693.0)       130.7 (4617.0)
   HC  SAMPLE METER/RANGE/PPM             78.2/ 3/  782      91.9/ 2/   92      15.3/ 3/  153        38.4/ 2/   38
   HC  BCKGRD METER/RANGE/PPM              1.7/ 3/   17      12.6/ 2/   13       1.3/ 3/   13        11.7/ 2/   12
   CO  SAMPLE METER/RANGE/PPM             24.0/ 3/  603      11.3/13/   11      46.5/13/   40         7.4/13/    7
   CO  BCKGRD METER/RANGE/PPM               .6/ 3/   14       8.7/13/    8       4.0/13/    5         2.4/13/    3
   CO2 SAMPLE METER/RANGE/PCT             85.2/ 3/ 1.58      58.3/ 3/ 1.03      79.0/ 3/ 1.45        57.4/ 3/ 1.02
   CO2 BCKGRD METER/RANGE/PCT              4.0/ 3/  .06       4.1/ 3/  .06       4.3/ 3/  .07         4.0/ 3/  .06
   NOX SAMPLE METER/RANGE/PPM             75.8/ 2/   76      45.0/ 2/   45      55.4/ 2/   55        42.6/ 2/   42
   NOX BCKGRD METER/RANGE/PPM              2.1/ 2/    2       1.3/ 2/    1       1.5/ 2/    2         1.3/ 2/    1
   DILUTION FACTOR                             7.82              12.96               9.13                13.04

   HC  CONCENTRATION PPM                       767                 30                 141                   27
   CO  CONCENTRATION PPM                       561                  3                  34                    4
   CO2 CONCENTRATION PCT                      1.52                .97                1.39                  .96
   NOX CONCENTRATION PPM                      74.0               43.8                59.1                 46.8
   HC  MASS GRAMS                            33.03               2.28                6.22                 2.07
   CO  MASS GRAMS                            44.94                .43                2.99                  .66
   CO2 MASS GRAMS                           2134.3             2327.2              1991.1               4305.0
   NOX MASS GRAMS                            10.96              11.11                7.44                10.34

   HC  GRAMS/KM                               5.87                .37                1.08                  .33
   CO  GRAMS/KM                               8.66                .07                 .52                  .11
   CO2 GRAMS/KM                              370.3              376.4               337.5                373.6
   NOX GRAMS/KM                               1.90               1.00                1.34                 1.68
   FUEL CONSUMPTION BY CB L/100KM            17.10              16.14               14.54                16.00

   RUN TIME               SECONDS              506                867                 505                  868
   AVG. EXH. OXYGEN       PERCENT             4.03               5.30                4.55                 5.63
   CATALYST AVG. TEMP.    DEG. C               381                538                 442                  528
   CATALYST MAX. TEMP.    DEG. C               610                634                 610                  601
   MEASURED DISTANCE      KM                  5.76               6.17                5.75                 6.17
        DFC, WET (DRY)                             .904 ( .891)                            .911 ( .898)
        SCF, WET (DRY)                            1.000 ( .974)                           1.000 ( .975)
        VOL (SCM)                                         207.3                                   207.0
        KM  (MEASURED)                                    11.94                                   11.92
COMPOSITE RESULTS
   TEST NUMBER             142-31
   BAROMETER     MM HG     742.4     TOTAL FUEL SULFUR   MG/KM    34.14     CARBON DIOXIDE       G/KM       3-BAG      (4-BAG)
   HUMIDITY      G/KG       11.1     AVG. EXH. OXYGEN    PCT       4.44     FUEL CONSUMPTION     L/100KM    364.7     ( 363.7)
   TEMPERATURE   DEG C      22.2     CATALYST AVG. TEMP. DEG C      503     HYDROCARBONS (THC)   G/KM       15.93     ( 15.89)
                                     CATALYST MAX. TEMP. DEG C      634     CARBON MONOXIDE      G/KM        1.71     (  1.70)
                                                                            OXIDES OF NITROGEN   G/KM        1.98     (  1.99)
                                                                                                             1.71     (  1.67)


                        PVM - 142   SET  VEHICLE EMISSIONS RESULTS - IGNITION MISFIRE
                                         PROJECT 11-4771-001

VEHICLE MODEL    78 FORD GRANADA          VEHICLE NO.    14                        TEST WEIGHT   1814 KG(  4000 LBS)
ENGINE 4.9 L(302 CID) V-8                 TRANSMISSION A3                          ACTUAL ROAD LOAD   9.8 KW( 13.2 HP)
                                          GVW  2113 KG(  4658 LBS)                 GASOLINE  EM-344
   TEST NUMBER
   TEST CYCLE                                142-32                   142-33
   RUN NUMBER                                 SET                      HFET
   DATE                                        1                        1
   ODOMETER                                 8/15/78                  8/15/78
   CVS - BAG CART - DYNAMOMETER          7117KM(  4422MILES)      7155KM(  4446MILES)              / /
                                            2 - 1 - 3                2 - 1 - 3
   TEMPERATURE DEG. C (DEG. F)
   RELATIVE HUMIDITY, PCT                  22.2 / 72.0              23.3 / 74.0
   BAROMETER, MM HG(IN HG)                    53.1                     47.1
   RUN TIME, SECONDS                      742.7 (29.24)            742.7 (29.24)
                                              1394                      765
   BLOWER DIF P MM. H2O(IN. H2O)
   BLOWER INLET P MM. H2O(IN. H2O)        762.0 (30.0)             762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)      762.0 (30.0)             762.0 (30.0)
   BLOWER REVOLUTIONS                      43.9 (111.0)             43.9 (111.0)
   CVS FLOW STD. CU. METRES(SCF)             112314                    61986
   HC  SAMPLE METER/RANGE/PPM            210.7 (7440.4)           115.3 (4073.4)
   HC  BCKGRD METER/RANGE/PPM             10.2/ 3/  102            10.3/ 3/  103
   CO  SAMPLE METER/RANGE/PPM              1.2/ 3/   12             1.3/ 3/   13
   CO  BCKGRD METER/RANGE/PPM             66.7/13/   52            37.7/13/   33
   CO2 SAMPLE METER/RANGE/PCT              3.2/13/    3             2.5/13/    2
   CO2 BCKGRD METER/RANGE/PCT             40.8/ 3/ 1.68            45.3/ 2/ 2.02
   NOX SAMPLE METER/RANGE/PPM              3.4/ 3/  .06             1.4/ 2/  .07
   NOX BCKGRD METER/RANGE/PPM             69.2/ 2/   69            86.4/ 2/   87
   HC  CONCENTRATION PPM                   1.3/ 2/    1             1.3/ 2/    1
   CO  CONCENTRATION PPM                        92                       92
   CO2 CONCENTRATION PCT                        47                       29
   NOX CONCENTRATION PPM                      1.63                     1.96
   HC  MASS GRAMS                             68.1                     88.0
   CO  MASS GRAMS                            11.12                     6.12
   CO2 MASS GRAMS                            11.55                     3.95
   NOX MASS GRAMS                           4273.1                   4196.1
        DFC, WET (DRY)                       26.03                    17.64
        SCF, WET (DRY)                    .874 ( .864)             .848 ( .841)
        VOL (SCM)                        1.000 ( .974)            1.000 ( .973)
        KM  (MEASURED)                       210.7                    115.3
                                             21.53                    16.30
   TEST NUMBER,            PVMT
   BAROMETER,              MM HG            142-32                   142-33
   HUMIDITY,               G/KG              742.7                    742.7
   TEMPERATURE,            DEG C               9.1                      8.6
   TOTAL FUEL SULFUR,      MG/KM              22.2                     23.3
                                             26.88                    23.41
   AVG. EXH. OXYGEN,       PCT
   CATALYST AVG. TEMP.,    DEG C              4.10                     3.06
   CATALYST MAX. TEMP.,    DEG C               543                      431
   CARBON DIOXIDE,         G/KM                678                      687
   FUEL CONSUMPTION,       L/100KM           291.4                    259.4
                                             12.54                    10.92
   HYDROCARBONS,           G/KM
   CARBON MONOXIDE,        G/KM                .52                      .38
   OXIDES OF NITROGEN,     G/KM                .54                      .24
                                              1.21                     1.04
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TABLE E-43. TEST 143 EMISSIONS RESULTS

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                        PVM - 143   FTP  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                         PROJECT 11-4771-001

TEST NO.   143-11    RUN   1              VEHICLE NO.   19                    TEST WEIGHT   1814 KG(  4000 LBS)
VEHICLE MODEL   78 FORD GRANADA           DATE    7/19/78                     ACTUAL ROAD LOAD   9.8 KW( 13.2 HP)
ENGINE 4.9 L(302 CID) V-8                 BAG CART NO.  1                     GASOLINE  EM-399
TRANSMISSION A3                           DYNO NO.      3                     ODOMETER   4202 KM(  2611 MILES)
GVW  2113 KG(  4658 LBS)                  CVS NO.       2

BAROMETER 742.95 MM HG(29.25 IN HG)       DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)
RELATIVE HUMIDITY 51 PCT                  ABS. HUMIDITY  9.7 GM/KG            NOX HUMIDITY CORRECTION FACTOR   .97
BAG RESULTS
   BAG NUMBER                                    1                2                 3                 4
   DESCRIPTION                            COLD TRANSIENT     STABILIZED       HOT TRANSIENT       STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)           749.3 (29.5)     749.3 (29.5)      749.3 (29.5)      749.3 (29.5)
   BLOWER INLET P MM. H2O(IN. H2O)         749.3 (29.5)     749.3 (29.5)      749.3 (29.5)      749.3 (29.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)        43.3 (110.0)     43.3 (110.0)      43.3 (110.0)      43.3 (110.0)
   BLOWER REVOLUTIONS                         40722            70397             40539             69798
   CVS FLOW STD. CU. METRES(SCF)          76.6 (2707.0)    132.4 (4677.3)     76.3 (2694.6)    131.3 (4639.1)
   HC  SAMPLE METER/RANGE/PPM             11.3/ 3/  113    14.5/ 2/   14     27.3/ 2/   27     13.5/ 2/   13
   HC  BCKGRD METER/RANGE/PPM               .6/ 3/    6     7.7/ 2/    8      7.0/ 2/    7      6.9/ 2/    7
   CO  SAMPLE METER/RANGE/PPM             18.9/ 3/  422    28.9/13/   26     36.0/13/   32     19.6/13/   18
   CO  BCKGRD METER/RANGE/PPM              1.0/ 3/   23    21.8/13/   20     19.5/13/   19     12.8/13/   12
   CO2 SAMPLE METER/RANGE/PCT             83.9/ 3/ 1.59    58.2/ 3/ 1.03     72.6/ 3/ 1.38     56.9/ 3/  .99
   CO2 BCKGRD METER/RANGE/PCT              4.2/ 3/  .06     4.4/ 3/  .07      4.4/ 3/  .07      4.7/ 3/  .07
   NOX SAMPLE METER/RANGE/PPM             67.1/ 2/   67    39.5/ 2/   39     45.0/ 2/   45     37.6/ 2/   37
   NOX BCKGRD METER/RANGE/PPM              1.3/ 2/    1     1.0/ 2/    1       .9/ 2/    1       .8/ 2/    1
   DILUTION FACTOR                            8.42            12.99             10.13             13.47

   HC  CONCENTRATION PPM                      108                7                21                 7
   CO  CONCENTRATION PPM                      383                7                18                 7
   CO2 CONCENTRATION PCT                     1.54              .96              1.26               .92
   NOX CONCENTRATION PPM                     66.0             38.6              44.2              36.8
   HC  MASS GRAMS                            4.76              .56               .92               .54
   CO  MASS GRAMS                           34.19             1.07              1.63              1.08
   CO2 MASS GRAMS                          2082.2           2339.9            1755.2            2229.6
   NOX MASS GRAMS                            9.36             9.45              6.24              8.99

   HC  GRAMS/KM                               .82              .09               .16               .09
   CO  GRAMS/KM                              5.86              .17               .28               .17
   CO2 GRAMS/KM                             356.9            375.9             302.0             358.3
   NOX GRAMS/KM                              1.60             1.52              1.07              1.44
   FUEL CONSUMPTION BY CB L/100KM           15.74            16.05             12.93             15.38

   RUN TIME              SECONDS              505              867               503               868
   AVG. EXH. OXYGEN      PERCENT             3.63             5.25              4.69              5.43
   CATALYST AVG. TEMP.   DEG. C                -                -                349               386
   CATALYST MAX. TEMP.   DEG. C                -                -                444               448
   MEASURED DISTANCE     KM                  5.83             6.23              5.81              6.21
        DFC, WET (DRY)                              .908 ( .899)                        .917 ( .907)
        SCF, WET (DRY)                             1.000 ( .979)                       1.000 ( .980)
        VOL (SCM)                                       209.1                               207.6
        KM  (MEASURED)                                  12.07                               12.02

COMPOSITE RESULTS                                                                                    3-BAG        (4-BAG)
   TEST NUMBER            143-11     TOTAL FUEL SULFUR    MG/KM    38.41     CARBON DIOXIDE       G/KM      351.4      ( 346.3)
   BAROMETER     MM HG    742.9      AVG. EXH. OXYGEN     PCT       4.87     FUEL CONSUMPTION     L/100KM    15.12      ( 14.91)
   HUMIDITY      G/KG       9.7      CATALYST AVG. TEMP. DEG C        -      HYDROCARBONS (THC)   G/KM        .26      (   .26)
   TEMPERATURE   DEG C     23.9      CATALYST MAX. TEMP. DEG C      444      CARBON MONOXIDE      G/KM       1.38      (  1.38)
                                                                           OXIDES OF NITROGEN   G/KM       1.41      (  1.34)
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                        PVM - 143   SET  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                         PROJECT 11-4771-001

                                          VEHICLE NO.     19                  TEST WEIGHT   1814 KG(  4000 LBS)
VEHICLE MODEL   78 FORD GRANADA           TRANSMISSION A3                     ACTUAL ROAD LOAD   9.8 KW( 13.2 HP)
ENGINE 4.9 L(302 CID) V-8                 GVW  2113 KG(  4658 LBS)            GASOLINE  EM-399

   TEST NUMBER                               143-12               143-13
   TEST CYCLE                                 SET                  HFET
   RUN NUMBER                                  2                    2
   DATE                                     7/19/78              7/19/78                        /  /
   ODOMETER                          4382KM(  2723MILES)   4421KM(  2747MILES)
   CVS - BAG CART - DYNAMOMETER            2 - 1 - 3            2 - 1 - 3

   TEMPERATURE DEG. C (DEG. F)            25.0 / 77.0          25.6 / 78.0
   RELATIVE HUMIDITY, PCT                    52.5                 46.9
   BAROMETER, MM HG(IN HG)               739.1 (29.10)        739.1 (29.10)
   RUN TIME, SECONDS                         1397                  766

   BLOWER DIF P MM. H2O(IN. H2O)         774.7 (30.5)         774.7 (30.5)
   BLOWER INLET P MM. H2O(IN. H2O)       774.7 (30.5)         774.7 (30.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)      43.3 (110.0)         43.3 (110.0)
   BLOWER REVOLUTIONS                       112290                62153
   CVS FLOW STD. CU. METRES(SCF)        209.2 (7390.1)       115.9 (4094.3)
   HC  SAMPLE METER/RANGE/PPM           39.1/ 2/   39        34.2/ 2/   34
   HC  BCKGRD METER/RANGE/PPM           26.8/ 2/   27        20.2/ 2/   20
   CO  SAMPLE METER/RANGE/PPM           58.9/13/   48        25.3/13/   23
   CO  BCKGRD METER/RANGE/PPM            3.8/13/    4         2.4/13/    2
   CO2 SAMPLE METER/RANGE/PCT           86.8/ 3/ 1.61        99.1/ 2/ 1.96
   CO2 BCKGRD METER/RANGE/PCT            3.5/ 3/  .05         1.6/ 2/  .06
   NOX SAMPLE METER/RANGE/PPM           56.8/ 2/   57        73.8/ 2/   74
   NOX BCKGRD METER/RANGE/PPM             .8/ 2/    1         1.2/ 2/    1
   HC  CONCENTRATION PPM                      16                   17
   CO  CONCENTRATION PPM                      42                   20
   CO2 CONCENTRATION PCT                    1.56                 1.91
   NOX CONCENTRATION PPM                    56.1                 72.8
   HC  MASS GRAMS                           1.88                 1.13
   CO  MASS GRAMS                          10.25                 2.70
   CO2 MASS GRAMS                         5993.3               4048.5
   NOX MASS GRAMS                          22.43                15.63
        DFC, WET (DRY)                  .874 ( .870)         .859 ( .846)
        SCF, WET (DRY)                 1.000 ( .975)        1.000 ( .973)
        VOL (SCM)                          209.2                115.9
        KM  (MEASURED)                     21.69                16.43

   TEST NUMBER,             PVMT          143-12               143-13
   BAROMETER,               MM HG          739.1                739.1
   HUMIDITY,                G/KG            10.7                  9.7
   TEMPERATURE,             DEG C           25.0                 25.6
   TOTAL FUEL SULFUR,       MG/KM          25.92                22.59

   AVG. EXH. OXYGEN,        PCT             4.41                 3.28
   CATALYST AVG. TEMP.,     DEG C            457                  479
   CATALYST MAX. TEMP.,     DEG C            542                  596
   CARBON DIOXIDE,          G/KM           276.4                246.5
   FUEL CONSUMPTION,        L/100KM        11.86                10.59

   HYDROCARBONS,            G/KM             .09                  .07
   CARBON MONOXIDE,         G/KM             .47                  .16
   OXIDES OF NITROGEN,      G/KM            1.04                  .95
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TABLE E-44. TEST 143 EMISSIONS RESULTS

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                    PVM - 143   FTP  VEHICLE EMISSIONS RESULTS - DISABLED EGR+AIR OPV
                                     PROJECT 11-4771-001

TEST NO.   143-21   RUN   1                    VEHICLE NO.   14                            TEST WEIGHT   1814 KG(  4000 LBS)
VEHICLE MODEL   78 FORD GRANADA                DATE     7/21/78                            ACTUAL ROAD LOAD   9.8 KW( 13.2 HP)
ENGINE 4.9 L(302 CID) V-8                      BAG CART NO.  1                             GASOLINE  EM-344
TRANSMISSION A3                                DYNO NO.      3                             ODOMETER   4754 KM(  2954 MILES)
GVW  2113 KG(  4658 LBS)                       CVS NO.       2

BAROMETER 740.66 MM HG(29.16 IN HG)            DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)
RELATIVE HUMIDITY 57 PCT                       ABS. HUMIDITY  9.8 GM/KG                    NOX HUMIDITY CORRECTION FACTOR   .97
BAG RESULTS
  BAG NUMBER                                        1                  2                    3                    4
  DESCRIPTION                                COLD TRANSIENT        STABILIZED          HOT TRANSIENT         STABILIZED

  BLOWER DIF P MM. H2O(IN. H2O)               762.0 (30.0)        762.0 (30.0)         762.0 (30.0)         762.0 (30.0)
  BLOWER INLET P MM. H2O(IN. H2O)             762.0 (30.0)        762.0 (30.0)         762.0 (30.0)         762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)            43.3 (110.0)        40.6 (105.0)         42.8 (109.0)         43.3 (110.0)
  BLOWER REVOLUTIONS                              40920               69697                40609                69575
  CVS FLOW STD. CU. METRES(SCF)               75.7 (2672.9)      131.0 (4627.8)        76.1 (2687.5)       130.2 (4599.7)
  HC  SAMPLE METER/RANGE/PPM                 19.0/ 3/  190       14.4/ 2/   14        39.0/ 2/   39        13.1/ 2/   13
  HC  BCKGRD METER/RANGE/PPM                   .6/ 3/    6        7.0/ 2/    7         6.0/ 2/    6         6.1/ 2/    6
  CO  SAMPLE METER/RANGE/PPM                 22.5/ 3/  519       15.6/13/   15        38.6/13/   39        10.0/13/   10
  CO  BCKGRD METER/RANGE/PPM                   .2/ 3/    5         .4/13/    0          .4/13/    0          .4/13/    0
  CO2 SAMPLE METER/RANGE/PCT                 82.0/ 3/ 1.51       57.6/ 3/ 1.02        72.6/ 3/ 1.32        56.6/ 3/  .99
  CO2 BCKGRD METER/RANGE/PCT                  4.0/ 3/  .06        4.5/ 3/  .07         4.6/ 3/  .07         4.6/ 3/  .07
  NOX SAMPLE METER/RANGE/PPM                 57.5/ 3/  172       33.0/ 3/   99        58.7/ 3/  176        33.8/ 3/  101
  NOX BCKGRD METER/RANGE/PPM                   .7/ 3/    2         .7/ 3/    2          .8/ 3/    2          .9/ 3/    3
  DILUTION FACTOR                                 8.51               13.16                10.12                13.45

  HC  CONCENTRATION PPM                            135                   8                   34                    7
  CO  CONCENTRATION PPM                            491                  14                   38                    4
  CO2 CONCENTRATION PCT                           1.46                 .95                 1.25                  .93
  NOX CONCENTRATION PPM                          170.6                97.1                173.9                 98.4
  HC  MASS GRAMS                                  5.88                 .60                 1.47                  .56
  CO  MASS GRAMS                                 43.29                2.11                 4.84                 1.35
  CO2 MASS GRAMS                                2018.4              2203.2               1796.7               2213.9
  NOX MASS GRAMS                                 23.96               23.60                24.56                23.90

  HC  GRAMS/KM                                    1.03                 .10                  .26                  .09
  CO  GRAMS/KM                                    7.56                 .34                  .84                  .22
  CO2 GRAMS/KM                                   353.2               370.0                303.4                358.2
  NOX GRAMS/KM                                    4.19                3.82                 4.27                 3.87
  FUEL CONSUMPTION BY CB L/100KM                 15.72               15.83                13.02                15.38

  RUN TIME                  SECONDS                503                 867                  505                  867
  AVG. EXH. OXYGEN          PERCENT               3.04                4.40                 3.81                 4.48
  CATALYST AVG. TEMP.       DEG. C                 264                 354                  325                  354
  CATALYST MAX. TEMP.       DEG. C                 402                 388                  414                  406
  MEASURED DISTANCE         KM                    5.72                6.17                 5.76                 6.18
       DFC, WET (DRY)                                    .909 ( .898)                              .917 ( .906)
       SCF, WET (DRY)                                   1.000 ( .977)                             1.000 ( .978)
       VOL (SCM)                                                206.7                                     206.3
       KM  (MEASURED)                                           11.89                                     11.94

COMPOSITE RESULTS
  TEST NUMBER                 143-21
  BAROMETER     MM HG   740.7     TOTAL FUEL SULFUR   MG/KM   32.22       CARBON DIOXIDE        G/KM      3-BAG      (4-BAG)
  HUMIDITY      G/KG      9.8     AVG. EXH. OXYGEN    PCT      4.07       FUEL CONSUMPTION      L/100KM   348.2      ( 344.8)
  TEMPERATURE   DEG C    22.2     CATALYST AVG. TEMP. DEG C     338       HYDROCARBONS (THC)    G/KM      15.03      ( 14.88)
                                  CATALYST MAX. TEMP. DEG C     414       CARBON MONOXIDE       G/KM        .33      (   .33)
                                                                          OXIDES OF NITROGEN    G/KM       1.88      (  1.89)
                                                                                                           4.02      (  4.03)


                    PVM - 143   SET  VEHICLE EMISSIONS RESULTS - DISABLED EGR+AIR OPV
                                     PROJECT 11-4771-001

VEHICLE MODEL   78 FORD GRANADA             VEHICLE NO.    14                     TEST WEIGHT   1814 KG(  4000 LBS)
ENGINE 4.9 L(302 CID) V-8                   TRANSMISSION A3                       ACTUAL ROAD LOAD   9.8 KW( 13.2 HP)
                                            GVW  2113 KG(  4658 LBS)              GASOLINE  EM-344

  TEST NUMBER                                   143-22                 143-23
  TEST CYCLE                                     SET                    HFET
  RUN NUMBER                                      1                      1
  DATE                                         7/21/78                7/21/78                    / /
  ODOMETER                                  4831KM(  3002MILES)    4868KM(  3025MILES)
  CVS - BAG CART - DYNAMOMETER                 2 - 1 - 3              2 - 1 - 3

  TEMPERATURE DEG. C (DEG. F)                24.4 / 76.0            26.1 / 79.0
  RELATIVE HUMIDITY, PCT                        45.1                   43.8
  BAROMETER, MM HG(IN HG)                  739.4 (29.11)          739.4 (29.11)
  RUN TIME, SECONDS                             1397                    767

  BLOWER DIF P MM. H2O(IN. H2O)             762.0 (30.0)           762.0 (30.0)
  BLOWER INLET P MM. H2O(IN. H2O)           762.0 (30.0)           762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)          43.3 (110.0)           42.8 (109.0)
  BLOWER REVOLUTIONS                          111984                  61797
  CVS FLOW STD. CU. METRES(SCF)             209.2 (7389.1)         115.5 (4079.0)
  HC  SAMPLE METER/RANGE/PPM                18.6/ 2/   19          19.3/ 2/   19
  HC  BCKGRD METER/RANGE/PPM                 4.4/ 2/    4           4.8/ 2/    5
  CO  SAMPLE METER/RANGE/PPM                24.0/13/   22          22.0/13/   20
  CO  BCKGRD METER/RANGE/PPM                  .2/13/    0            .6/13/    1
  CO2 SAMPLE METER/RANGE/PCT                88.7/ 3/ 1.65          99.8/ 2/ 1.99
  CO2 BCKGRD METER/RANGE/PCT                 3.1/ 3/  .05           1.5/ 2/  .05
  NOX SAMPLE METER/RANGE/PPM                97.6/ 3/  293          38.2/ 4/  382
  NOX BCKGRD METER/RANGE/PPM                  .7/ 3/    2            .4/ 4/    4
  HC  CONCENTRATION PPM                          14                     15
  CO  CONCENTRATION PPM                          21                     19
  CO2 CONCENTRATION PCT                         1.61                   1.94
  NOX CONCENTRATION PPM                        291.0                  378.6
  HC  MASS GRAMS                                1.73                   1.01
  CO  MASS GRAMS                                5.10                   2.53
  CO2 MASS GRAMS                              6166.0                 4120.2
  NOX MASS GRAMS                              109.66                  80.39
       DFC, WET (DRY)                       .876 ( .869)           .851 ( .844)
       SCF, WET (DRY)                      1.000 ( .977)          1.000 ( .974)
       VOL (SCM)                               209.2                  115.5
       KM  (MEASURED)                          21.71                  16.38

  TEST NUMBER,             PVMI                143-22                 143-23
  BAROMETER,               MM HG                739.4                  739.4
  HUMIDITY,                G/KG                  9.8                    9.5
  TEMPERATURE,             DEG C                24.4                   26.1
  TOTAL FUEL SULFUR,       MG/KM               26.03                  23.05

  AVG. EXH. OXYGEN,        PCT                  3.06                   1.62
  CATALYST AVG. TEMP.,     DEG C                 424                    474
  CATALYST MAX. TEMP.,     DEG C                 521                    525
  CARBON DIOXIDE,          G/KM                284.0                  251.6
  FUEL CONSUMPTION,        L/100KM             12.19                  10.76

  HYDROCARBONS,            G/KM                  .08                    .06
  CARBON MONOXIDE,         G/KM                  .23                    .15
  OXIDES OF NITROGEN,      G/KM                 5.06                   4.91
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TABLE E-45. TEST 143 EMISSIONS RESULTS

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                      PVM - 143   FTP  VEHICLE EMISSIONS RESULTS - DISABLED EGR+AIR 8PV
                                       PROJECT 11-4771-001

TEST NO.   143-31   RUN   1                VEHICLE NO.   19                     TEST WEIGHT   1814 KG(  4000 LBS)
VEHICLE MODEL    78 FORD GRANADA           DATE    7/29/78                      ACTUAL ROAD LOAD   9.8 KW( 13.2 HP)
ENGINE 4.9 L(302 CID) V-8                  BAG CART NO.  1                      GASOLINE  EM-399
TRANSMISSION A3                            DYNO NO.      3                      ODOMETER   4897 KM(  3043 MILES)
GVW  2113 KG(  4658 LBS)                   CVS NO.       8

BAROMETER 744.98 MM HG(29.33 IN HG)        DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)
RELATIVE HUMIDITY 49 PCT                   ABS. HUMIDITY  8.4 GM/KG             NOX HUMIDITY CORRECTION FACTOR   .93
BAG RESULTS
   BAG NUMBER                                    1                 2                  3                  4
   DESCRIPTION                             COLD TRANSIENT      STABILIZED        HOT TRANSIENT        STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)           749.3 (29.5)       749.3 (29.5)       749.3 (29.5)       749.3 (29.5)
   BLOWER INLET P MM. H2O(IN. H2O)         749.3 (29.5)       749.3 (29.5)       749.3 (29.5)       749.3 (29.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)        43.3 (110.0)       43.3 (110.0)       43.3 (110.0)       43.3 (110.0)
   BLOWER REVOLUTIONS                          40660              69717              40671              69579
   CVS FLOW STD. CU. METRES(SCF)           76.7 (2710.6)     131.6 (4647.5)      76.8 (2711.3)     131.3 (4638.1)
   HC  SAMPLE METER/RANGE/PPM             16.5/ 3/  165      19.7/ 2/   15      47.7/ 2/   48      13.2/ 2/   13
   HC  BCKGRD METER/RANGE/PPM               .7/ 3/    7       8.7/ 2/    9       6.8/ 2/    7       7.0/ 2/    7
   CO  SAMPLE METER/RANGE/PPM             29.5/ 3/  567       9.9/13/    9      55.8/13/   46       6.5/13/    6
   CO  BCKGRD METER/RANGE/PPM               .2/ 3/    5       9.0/13/    9       2.5/13/    2       1.4/13/    1
   CO2 SAMPLE METER/RANGE/PCT             86.1/ 3/ 1.60      58.4/ 3/ 1.03      78.6/ 3/ 1.44      57.7/ 3/ 1.02
   CO2 BCKGRD METER/RANGE/PCT              4.1/ 3/  .06       3.9/ 3/  .06       4.4/ 3/  .07       3.8/ 3/  .06
   NOX SAMPLE METER/RANGE/PPM             62.5/ 3/  188      32.4/ 3/   97      72.7/ 3/  218      33.4/ 3/  100
   NOX BCKGRD METER/RANGE/PPM               .5/ 3/    2        .6/ 3/    2        .5/ 3/    2        .5/ 3/    2
   DILUTION FACTOR                              8.09              12.96               9.29              13.15

   HC  CONCENTRATION PPM                        159                  7                 42                  7
   CO  CONCENTRATION PPM                        537                  5                 42                  5
   CO2 CONCENTRATION PCT                       1.54                .98               1.38                .96
   NOX CONCENTRATION PPM                      186.2               95.5              216.8               98.8
   HC  MASS GRAMS                              7.03                .51               1.84                .51
   CO  MASS GRAMS                             47.98                .79               3.73                .79
   CO2 MASS GRAMS                            2166.5             2351.9             1990.6             2317.2
   NOX MASS GRAMS                             25.39              22.39              29.57              23.06

   HC  GRAMS/KM                                1.22                .08                .32                .08
   CO  GRAMS/KM                                8.35                .13                .66                .12
   CO2 GRAMS/KM                               376.9              384.3              349.6              377.7
   NOX GRAMS/KM                                4.42               3.65               5.19               3.76
   FUEL CONSUMPTION BY CB L/100KM             16.01              16.42              14.63              16.19

   RUN TIME               SECONDS               505                867                506                866
   AVG. EXH. OXYGEN       PERCENT              2.49               4.45               3.58               4.66
   CATALYST AVG. TEMP.    DEG. C                281                379                335                381
   CATALYST MAX. TEMP.    DEG. C                418                423                440                427
   MEASURED DISTANCE      KM                   5.75               6.12               5.70               6.13
        DFC, WET (DRY)                              .905 ( .897)                          .912 ( .903)
        SCF, WET (DRY)                             1.000 ( .979)                         1.000 ( .980)
        VOL (SCM)                                      208.3                                 208.1
        KM  (MEASURED)                                 11.87                                 11.83

COMPOSITE RESULTS                                                                                      3-BAG          (4-BAG)
   TEST NUMBER           143-31      TOTAL FUEL SULFUR   MG/KM   34.31      CARBON DIOXIDE      G/KM      370.8         ( 368.8)
   BAROMETER    MM HG    745.0       AVG. EXH. OXYGEN    PCT      4.03      FUEL CONSUMPTION    L/100KM   16.01         ( 15.93)
   HUMIDITY     G/KG       8.4       CATALYST AVG. TEMP. DEG C     359      HYDROCARBONS (THC)  G/KM        .49         (   .39)
   TEMPERATURE  DEG C     22.2       CATALYST MAX. TEMP. DEG C     440      CARBON MONOXIDE     G/KM       1.99         (  1.98)
                                                                            OXIDES OF NITROGEN  G/KM       4.83         (  4.86)
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                      PVM - 143   SET  VEHICLE EMISSIONS RESULTS - DISABLED EGR+AIR 8PV
                                       PROJECT 11-4771-001

                                           VEHICLE NO.      19                  TEST WEIGHT   1814 KG(  4000 LBS)
VEHICLE MODEL    78 FORD GRANADA           TRANSMISSION A3                      ACTUAL ROAD LOAD   9.8 KW( 13.2 HP)
ENGINE 4.9 L(302 CID) V-8                  GVW  2113 KG(  4658 LBS)             GASOLINE  EM-399

   TEST NUMBER                             143-32                  143-33
   TEST CYCLE                               SET                     HFET
   RUN NUMBER                                1                       1
   DATE                                   7/29/78                 7/29/78                     / /
   ODOMETER                          4926KM(  3061MILES)     4963KM(  3084MILES)
   CVS - BAG CART - DYNAMOMETER           2 - 1 - 3               2 - 1 - 3

   TEMPERATURE DEG. C (DEG. F)           23.3 / 74.0             24.4 / 76.0
   RELATIVE HUMIDITY, PCT                   47.1                    41.6
   BAROMETER, MM HG(IN HG)              744.7 (29.32)           744.7 (29.32)
   RUN TIME, SECONDS                        1398                     765

   BLOWER DIF P MM. H2O(IN. H2O)         749.3 (29.5)            749.3 (29.5)
   BLOWER INLET P MM. H2O(IN. H2O)       749.3 (29.5)            749.3 (29.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)      43.3 (110.0)            43.3 (110.0)
   BLOWER REVOLUTIONS                       112236                   61911
   CVS FLOW STD. CU. METRES(SCF)        211.7 (7478.7)          115.9 (4098.1)
   HC  SAMPLE METER/RANGE/PPM           22.2/ 2/   22           24.5/ 2/   24
   HC  BCKGRD METER/RANGE/PPM           10.5/ 2/   10           10.1/ 2/   10
   CO  SAMPLE METER/RANGE/PPM           33.7/13/   30           27.0/13/   25
   CO  BCKGRD METER/RANGE/PPM            9.8/13/    9           16.8/13/   16
   CO2 SAMPLE METER/RANGE/PCT           88.3/ 3/ 1.69           43.1/ 2/ 1.90
   CO2 BCKGRD METER/RANGE/PCT            3.6/ 3/  .06            1.7/ 2/  .06
   NOX SAMPLE METER/RANGE/PPM           99.4/ 3/  298           38.7/ 4/  387
   NOX BCKGRD METER/RANGE/PPM             .9/ 3/    3             .4/ 4/    4
   HC  CONCENTRATION PPM                     13                      16
   CO  CONCENTRATION PPM                     21                      10
   CO2 CONCENTRATION PCT                   1.59                    1.85
   NOX CONCENTRATION PPM                  295.8                   383.6
   HC  MASS GRAMS                          1.59                    1.06
   CO  MASS GRAMS                          5.07                    1.35
   CO2 MASS GRAMS                        6181.9                  3925.5
   NOX MASS GRAMS                        111.91                   78.24
        DFC, WET (DRY)                .877 ( .864)            .858 ( .852)
        SCF, WET (DRY)               1.000 ( .976)           1.000 ( .975)
        VOL (SCM)                         211.7                   115.9
        KM  (MEASURED)                    21.96                   16.13

   TEST NUMBER,          PVMT            143-32                  143-33
   BAROMETER,            MM HG            744.7                   744.7
   HUMIDITY,             G/KG               8.0                     8.1
   TEMPERATURE,          DEG C             23.3                    24.4
   TOTAL FUEL SULFUR,    MG/KM            26.41                   22.29

   AVG. EXH. OXYGEN,     PCT               3.05                    1.72
   CATALYST AVG. TEMP.,  DEG C              442                     481
   CATALYST MAX. TEMP.,  DEG C              524                     537
   CARBON DIOXIDE,       G/KM             284.1                   243.3
   FUEL CONSUMPTION,     L/100KM          12.32                   10.40

   HYDROCARBONS,         G/KM               .07                     .07
   CARBON MONOXIDE,      G/KM               .24                     .08
   OXIDES OF NITROGEN,   G/KM              5.22                    4.85
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TABLE E-46. TEST 145 EMISSIONS RESULTS

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                         PVM - 145   FTP  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                          PROJECT 11-4771-001

TEST NO.   145-11   RUN   1                    VEHICLE NO.   14                TEST WEIGHT   1814 KG(  4000 LBS)
VEHICLE MODEL   78 FORD GRANADA                DATE    8/28/78                 ACTUAL ROAD LOAD   9.8 KW( 13.2 HP)
ENGINE 4.9 L(302 CID) V-8                      BAG CART NO.  1                 GASOLINE  EM-399
TRANSMISSION A3                                DYNO NO.      3                 ODOMETER   8785 KM(  5459 MILES)
GVW  2113 KG(  4658 LBS)                       CVS NO.       2

BAROMETER 738.12 MM HG(29.06 IN HG)            DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)
RELATIVE HUMIDITY 66 PCT                       ABS. HUMIDITY 12.2 GM/KG
BAG RESULTS                                                                    NOX HUMIDITY CORRECTION FACTOR  1.05
   BAG NUMBER                                        1                  2                    3                   4
   DESCRIPTION                               COLD TRANSIENT        STABILIZED          HOT TRANSIENT          STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)             762.0 (30.0)        762.0 (30.0)         762.0 (30.0)        762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)           762.0 (30.0)        762.0 (30.0)         762.0 (30.0)        762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)          43.3 (110.0)        43.3 (110.0)         43.3 (110.0)        43.3 (110.0)
   BLOWER REVOLUTIONS                            40801               70101                40859               69700
   CVS FLOW STD. CU. METRES(SCF)              76.1 (2688.0)      130.8 (4618.6)        76.2 (2691.5)      130.0 (4591.1)
   HC  SAMPLE METER/RANGE/PPM                10.3/ 3/  103       17.4/ 2/   17        43.5/ 2/   43       14.8/ 2/   15
   HC  BCKGRD METER/RANGE/PPM                 1.4/ 3/   14       12.8/ 2/   13        11.2/ 2/   11       10.8/ 2/   11
   CO  SAMPLE METER/RANGE/PPM                83.5/11/  392       10.8/13/   10        83.9/13/   60        7.2/13/    7
   CO  BCKGRD METER/RANGE/PPM                 2.3/11/    7        6.3/13/    6         4.1/13/    4        3.6/13/    3
   CO2 SAMPLE METER/RANGE/PCT                82.9/ 3/ 1.53       56.1/ 3/  .99        72.9/ 3/ 1.31       52.6/ 3/  .92
   CO2 BCKGRD METER/RANGE/PCT                 4.0/ 3/  .06        3.9/ 3/  .06         3.8/ 3/  .06        4.6/ 3/  .07
   NOX SAMPLE METER/RANGE/PPM                55.5/ 2/   55       31.2/ 2/   31        39.2/ 2/   39       26.7/ 2/   27
   NOX BCKGRD METER/RANGE/PPM                  .6/ 2/    1         .5/ 2/    1          .5/ 2/    1         .5/ 2/    1
   DILUTION FACTOR                                8.49               13.55                10.13               14.57

   HC  CONCENTRATION PPM                            91                   6                   33                   5
   CO  CONCENTRATION PPM                           366                   4                   59                   4
   CO2 CONCENTRATION PCT                          1.48                 .93                 1.26                 .85
   NOX CONCENTRATION PPM                          55.0                30.7                 38.7                26.2
   HC  MASS GRAMS                                 3.98                 .42                 1.47                 .36
   CO  MASS GRAMS                                32.46                 .67                 4.78                 .59
   CO2 MASS GRAMS                               2056.8              2228.2               1759.3              2027.2
   NOX MASS GRAMS                                 8.40                8.07                 5.93                6.85

   HC  GRAMS/KM                                    .69                 .07                  .26                 .06
   CO  GRAMS/KM                                   5.66                 .11                  .83                 .09
   CO2 GRAMS/KM                                  358.5               362.3                307.0               328.8
   NOX GRAMS/KM                                   1.46                1.31                 1.03                1.11
   FUEL CONSUMPTION BY CB L/100KM                15.78               15.48                13.19               14.05

   RUN TIME             SECONDS                    505                 867                  506                 866
   AVG. EXH. OXYGEN     PERCENT                   4.18                5.97                 5.02                6.35
   CATALYST AVG. TEMP.  DEG. C                     391                 416                  358                 416
   CATALYST MAX. TEMP.  DEG. C                     478                 482                  474                 478
   MEASURED DISTANCE    KM                        5.74                6.15                 5.73                6.17
        DFC, WET (DRY)                               .910 ( .897)                       .920 ( .907)
        SCF, WET (DRY)                              1.000 ( .974)                      1.000 ( .976)
        VOL (SCM)                                           206.9                              206.2
        KM  (MEASURED)                                      11.89                              11.90

COMPOSITE RESULTS
   TEST NUMBER             145-11
   BAROMETER     MM HG     738.1      TOTAL FUEL SULFUR    MG/KM   31.96      CARBON DIOXIDE        G/KM       346.3      ( 336.4)
   HUMIDITY      G/KG       12.2      AVG. EXH. OXYGEN     PCT      5.44      FUEL CONSUMPTION      L/100KM    14.91      ( 14.49)
   TEMPERATURE   DEG C      23.3      CATALYST AVG. TEMP. DEG C      392      HYDROCARBONS (THC)    G/KM         .25      (   .25)
                                      CATALYST MAX. TEMP. DEG C      482      CARBON MONOXIDE       G/KM        1.96      (  1.95)
                                                                              OXIDES OF NITROGEN    G/KM        1.27      (  1.21)
                                                                                                                3-BAG       (4-BAG)
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                         PVM - 145   SET  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                          PROJECT 11-4771-001

VEHICLE MODEL   78 FORD GRANADA                VEHICLE NO.   14                TEST WEIGHT   1814 KG(  4000 LBS)
ENGINE 4.9 L(302 CID) V-8                      TRANSMISSION A3                 ACTUAL ROAD LOAD   9.8 KW( 13.2 HP)
                                               GVW  2113 KG(  4658 LBS)        GASOLINE  EM-399

   TEST NUMBER                                 145-12                  145-13
   TEST CYCLE                                   SET                     HFET
   RUN NUMBER                                    1                        1
   DATE                                       8/28/78                  8/28/78
   ODOMETER                             8814KM(  5477MILES)      8851KM( 5500MILES)        /  /
   CVS - BAG CART - DYNAMOMETER              2 - 1 - 3                2 - 1 - 3

   TEMPERATURE DEG. C (DEG. F)              22.8 / 73.0              22.8 / 73.0
   RELATIVE HUMIDITY, PCT                       50.1                     50.1
   BAROMETER, MM HG(IN HG)                738.1 (29.06)            738.1 (29.06)
   RUN TIME, SECONDS                            1397                      765

   BLOWER DIF P MM. H2O(IN. H2O)            762.0 (30.0)             762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)          762.0 (30.0)             762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)         43.3 (110.0)             43.3 (110.0)
   BLOWER REVOLUTIONS                          112561                    61788
   CVS FLOW STD. CU. METRES(SCF)           209.9 (7414.7)           115.2 (4070.6)
   HC  SAMPLE METER/RANGE/PPM               19.9/ 2/   20            19.5/ 2/   19
   HC  BCKGRD METER/RANGE/PPM                8.6/ 2/    9             7.8/ 2/    8
   CO  SAMPLE METER/RANGE/PPM               32.5/13/   29             8.6/13/    8
   CO  BCKGRD METER/RANGE/PPM                4.1/13/    4             2.3/13/    2
   CO2 SAMPLE METER/RANGE/PCT               89.9/ 3/ 1.57            97.2/ 3/ 1.83
   CO2 BCKGRD METER/RANGE/PCT                3.7/ 3/  .06             3.6/ 3/  .06
   NOX SAMPLE METER/RANGE/PPM               53.4/ 2/   53            61.0/ 2/   61
   NOX BCKGRD METER/RANGE/PPM                1.0/ 2/    1             1.1/ 2/    1
   HC  CONCENTRATION PPM                         12                       13
   CO  CONCENTRATION PPM                         24                        6
   CO2 CONCENTRATION PCT                       1.52                     1.78
   NOX CONCENTRATION PPM                       52.5                     60.1
   HC  MASS GRAMS                              1.49                      .85
   CO  MASS GRAMS                              5.94                      .80
   CO2 MASS GRAMS                            5849.5                   3760.9
   NOX MASS GRAMS                             19.91                    12.50
        DFC, WET (DRY)                     .882 ( .874)             .863 ( .855)
        SCF, WET (DRY)                    1.000 ( .976)            1.000 ( .973)
        VOL (SCM)                             209.9                    115.2
        KM  (MEASURED)                        21.72                    16.14

   TEST NUMBER,              PVMT            145-12                   145-13
   BAROMETER,                MM HG            738.1                    738.1
   HUMIDITY,                 G/KG               8.9                      8.9
   TEMPERATURE,              DEG C             22.8                     22.8
   TOTAL FUEL SULFUR,        MG/KM            29.69                    21.39

   AVG. EXH. OXYGEN,         PCT               4.78                     3.38
   CATALYST AVG. TEMP.,      DEG C              483                      520
   CATALYST MAX. TEMP.,      DEG C              572                      572
   CARBON DIOXIDE,           G/KM             269.3                    233.0
   FUEL CONSUMPTION,         L/100KM          11.52                     9.96

   HYDROCARBONS,             G/KM               .07                      .05
   CARBON MONOXIDE,          G/KM               .27                      .05
   OXIDES OF NITROGEN,       G/KM               .92                      .77
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TABLE E-47. TEST 145 EMISSIONS RESULTS

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                        PVM - 145   FTP  VEHICLE EMISSIONS RESULTS - NO AIR INJ. + E.G.R.
                                         PROJECT 11-4771-001

TEST NO.   145-21   RUN   1                     VEHICLE NO.   19              TEST WEIGHT   1814 KG(  4000 LBS)
VEHICLE MODEL   78 FORD GRANADA                 DATE    9/ 8/78               ACTUAL ROAD LOAD   9.8 KW( 13.2 HP)
ENGINE 4.9 L(302 CID) V-8                       BAG CART NO.  1               GASOLINE  EM-344
TRANSMISSION A3                                 DYNO NO.      3               ODOMETER   9180 KM(  5704 MILES)
GVW  2113 KG(  4658 LBS)                        CVS NO.       2

BAROMETER 739.14 MM HG(29.10 IN HG)             DRY BULB TEMP. 21.7 DEG C(71.0 DEG F)
RELATIVE HUMIDITY 69 PCT                        ABS. HUMIDITY 11.9 GM/KG      NOX HUMIDITY CORRECTION FACTOR  1.02
BAG RESULTS
  BAG NUMBER                                          1                   2                   3                   4
  DESCRIPTION                                   COLD TRANSIENT       STABILIZED        HOT TRANSIENT        STABILIZED

  BLOWER DIF P MM. H2O(IN. H2O)                 736.6 (29.0)       756.9 (29.8)       749.3 (29.5)       749.3 (29.5)
  BLOWER INLET P MM. H2O(IN. H2O)               749.3 (29.5)       762.0 (30.0)       762.0 (30.0)       762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)              43.3 (110.0)       43.3 (110.0)       43.3 (110.0)       43.3 (110.0)
  BLOWER REVOLUTIONS                               40861              69739              40603              69601
  CVS FLOW STD. CU. METRES(SCF)                  76.5 (2702.4)     130.3 (4601.1)      76.0 (2685.2)     130.2 (4598.7)
  HC  SAMPLE METER/RANGE/PPM                    29.3/ 3/  293      23.0/ 3/  230      20.4/ 3/  204      19.7/ 3/  197
  HC  BCKGRD METER/RANGE/PPM                     1.8/ 3/   18       1.7/ 3/   17       1.6/ 3/   16       1.6/ 3/   16
  CO  SAMPLE METER/RANGE/PPM                    86.2/ 3/ 2386      98.9/ 3/ 2874      71.9/ 3/ 1867      88.9/ 3/ 2489
  CO  BCKGRD METER/RANGE/PPM                      .7/ 3/   16        .5/ 3/   11        .3/ 3/    7        .7/ 3/   16
  CO2 SAMPLE METER/RANGE/PCT                    77.3/ 3/ 1.41      96.5/ 3/  .80      70.0/ 3/ 1.26      96.3/ 3/  .80
  CO2 BCKGRD METER/RANGE/PCT                     3.8/ 3/  .06       4.5/ 3/  .07       4.6/ 3/  .07       4.6/ 3/  .07
  NOX SAMPLE METER/RANGE/PPM                    36.0/ 2/   36       9.7/ 2/   10      30.9/ 2/   31      11.9/ 2/   12
  NOX BCKGRD METER/RANGE/PPM                      .8/ 2/    1        .7/ 2/    1        .7/ 2/    1        .9/ 2/    1
  DILUTION FACTOR                                   8.02               12.19               9.16              12.69

  HC  CONCENTRATION PPM                              277                219                190                182
  CO  CONCENTRATION PPM                             2255               2756               1775               2382
  CO2 CONCENTRATION PCT                             1.36                .74               1.20                .73
  NOX CONCENTRATION PPM                             35.3                9.1               30.3               11.1
  HC  MASS GRAMS                                   12.23              16.11               8.32              13.69
  CO  MASS GRAMS                                  200.93             418.03             157.10             361.11
  CO2 MASS GRAMS                                  1909.6             1757.2             1672.9             1743.2
  NOX MASS GRAMS                                    5.29               2.31               4.51               2.82

  HC  GRAMS/KM                                      2.15               2.63               1.46               2.24
  CO  GRAMS/KM                                     35.30              68.32              27.54              59.11
  CO2 GRAMS/KM                                     335.5              287.2              293.5              285.3
  NOX GRAMS/KM                                       .93                .38                .79                .46
  FUEL CONSUMPTION BY CB L/100KM                   16.98              17.20              14.56              16.95

  RUN TIME              SECONDS                      505                867                505                867
  AVG. EXH. OXYGEN      PERCENT                     4.18               6.55               4.73               6.50
  CATALYST AVG. TEMP.   DEG. C                       302                368                336                379
  CATALYST MAX. TEMP.   DEG. C                       453                439                454                443
  MEASURED DISTANCE     KM                          5.69               6.12               5.70               6.11
      DFC, WET (DRY)                                      .902 ( .888)                          .910 ( .896)
      SCF, WET (DRY)                                     1.000 ( .975)                         1.000 ( .975)
      VOL (SCM)                                                 206.8                                 206.2
      KM  (MEASURED)                                            11.81                                 11.81

COMPOSITE RESULTS                                                                                    3-BAG        (4-BAG)
  TEST NUMBER           145-21     TOTAL FUEL SULFUR   MG/KM   35.20    CARBON DIOXIDE       G/KM     298.8       ( 298.3)
  BAROMETER    MM HG    739.1      AVG. EXH. OXYGEN    PCT      5.79    FUEL CONSUMPTION     L/100KM  16.42       ( 16.20)
  HUMIDITY     G/KG      11.9      CATALYST AVG. TEMP. DEG C     351    HYDROCARBONS (THC)   G/KM      2.21       (  2.09)
  TEMPERATURE  DEG C     21.7      CATALYST MAX. TEMP. DEG C     464    CARBON MONOXIDE      G/KM     50.26       ( 47.59)
                                                                        OXIDES OF NITROGEN   G/KM       .61       (   .63)


                        PVM - 145   SBT  VEHICLE EMISSIONS RESULTS - NO AIR INJ. + E.G.R.
                                         PROJECT 11-4771-001

                                                VEHICLE NO.     19            TEST WEIGHT   1814 KG(  4000 LBS)
VEHICLE MODEL   78 FORD GRANADA                 TRANSMISSION A3               ACTUAL ROAD LOAD   9.8 KW( 13.2 HP)
ENGINE 4.9 L(302 CID) V-8                       GVW  2113 KG(  4658 LBS)      GASOLINE  EM-344

  TEST NUMBER                                     145-22                145-23
  TEST CYCLE                                       SET                   HFET
  RUN NUMBER                                        1                     1
  DATE                                           9/ 8/78               9/ 8/78                          / /
  ODOMETER                                   9209KM(  5722MILES)   9246KM(  5745MILES)
  CVS - BAG CART - DYNAMOMETER                   2 - 1 - 3             2 - 1 - 3

  TEMPERATURE DEG. C (DEG. F)                   22.8 / 73.0           23.3 / 74.0
  RELATIVE HUMIDITY, PCT                           65.9                  50.7
  BAROMETER, MM HG(IN HG)                     739.4 (29.11)         739.4 (29.11)
  RUN TIME, SECONDS                                1396                   766

  BLOWER DIF P MM. H2O(IN. H2O)                756.9 (29.8)          756.9 (29.8)
  BLOWER INLET P MM. H2O(IN. H2O)              762.0 (30.0)          762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)             43.9 (111.0)          43.3 (110.0)
  BLOWER REVOLUTIONS                              112903                 61793
  CVS FLOW STD. CU. METRES(SCF)               209.9 (7412.3)        115.4 (4075.8)
  HC  SAMPLE METER/RANGE/PPM                   15.4/ 3/  154         64.2/ 2/   64
  HC  BCKGRD METER/RANGE/PPM                    1.1/ 3/   11         10.8/ 2/   11
  CO  SAMPLE METER/RANGE/PPM                   59.2/ 3/ 1407         80.4/11/  373
  CO  BCKGRD METER/RANGE/PPM                     .3/ 3/    7          1.6/11/    5
  CO2 SAMPLE METER/RANGE/PCT                   79.5/ 3/ 1.46         93.3/ 2/ 1.91
  CO2 BCKGRD METER/RANGE/PCT                    3.9/ 3/  .06          1.6/ 2/  .06
  NOX SAMPLE METER/RANGE/PPM                   37.7/ 2/   38         69.4/ 2/   69
  NOX BCKGRD METER/RANGE/PPM                     .6/ 2/    1          1.1/ 2/    1
  HC  CONCENTRATION PPM                            149                    55
  CO  CONCENTRATION PPM                           1408                   349
  CO2 CONCENTRATION PCT                           1.41                  1.86
  NOX CONCENTRATION PPM                           37.2                  68.5
  HC  MASS GRAMS                                 17.97                  3.66
  CO  MASS GRAMS                                344.08                 46.86
  CO2 MASS GRAMS                                5406.9                3939.4
  NOX MASS GRAMS                                 15.34                 14.45
      DFC, WET (DRY)                        .879 ( .867)          .859 ( .846)
      SCF, WET (DRY)                       1.000 ( .972)         1.000 ( .972)
      VOL (SCM)                                  209.9                 115.4
      KM  (MEASURED)                             21.94                 16.43

  TEST NUMBER,          PVMT                    145-22                145-23
  BAROMETER,            MM HG                    739.4                 739.4
  HUMIDITY,             G/KG                      11.6                   9.3
  TEMPERATURE,          DEG C                     22.8                  23.3
  TOTAL FUEL SULFUR,    MG/KM                    25.02                 22.91

  AVG. EXH. OXYGEN,     PCT                       4.28                  2.21
  CATALYST AVG. TEMP.,  DEG C                      437                   509
  CATALYST MAX. TEMP.,  DEG C                      533                   546
  CARBON DIOXIDE,       G/KM                     246.4                 239.8
  FUEL CONSUMPTION,     L/100KM                  11.68                 10.46

  HYDROCARBONS,         G/KM                       .82                   .22
  CARBON MONOXIDE,      G/KM                     15.68                  2.85
  OXIDES OF NITROGEN,   G/KM                       .70                   .88
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TABLE E-49. TEST 145 EMISSIONS RESULTS

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                         PVM - 145   FTP   VEHICLE EMISSIONS RESULTS - NO AIR INJ. + R.O.I.
                                           PROJECT 11-4771-001

TEST NO.    145-31   RUN   1                  VEHICLE NO.   14                  TEST WEIGHT   1814 KG(  4000 LBS)
VEHICLE MODEL   78 FORD GRANADA               DATE    9/11/78                   ACTUAL ROAD LOAD   9.8 KW( 13.2 HP)
ENGINE 4.9 L(302 CID) V-8                     BAG CART NO.  1                   GASOLINE  EM-344
TRANSMISSION A3                               DYNO NO.      3                   ODOMETER       0 KM(    -0 MILES)
GVW  2113 KG(  4658 LBS)                      CVS NO.       2

BAROMETER 735.08 MM HG(28.94 IN HG)           DRY BULB TEMP. 22.8 DEG C(73.0 DEG F)
RELATIVE HUMIDITY 58 PCT                      ABS. HUMIDITY 10.3 GM/KG
BAG RESULTS                                                                     NOX HUMIDITY CORRECTION FACTOR   .99
   BAG NUMBER                                       1                  2                  3                  4
   DESCRIPTION                               COLD TRANSIENT       STABILIZED        HOT TRANSIENT        STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)              749.3 (29.5)       762.0 (30.0)       749.3 (29.5)       749.3 (29.5)
   BLOWER INLET P MM. H2O(IN. H2O)            749.3 (29.5)       762.0 (30.0)       749.3 (29.5)       749.3 (29.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)           43.3 (110.0)       43.3 (110.0)       43.3 (110.0)       43.3 (110.0)
   BLOWER REVOLUTIONS                             40793              69803              40618              69706
   CVS FLOW STD. CU. METRES(SCF)              75.8 (2676.7)     129.6 (4576.9)      75.5 (2668.1)     129.6 (4578.9)
   HC  SAMPLE METER/RANGE/PPM                32.9/ 3/  329      23.3/ 3/  233      20.5/ 3/  205      20.4/ 3/  204
   HC  BCKGRD METER/RANGE/PPM                 1.1/ 3/   11       1.3/ 3/   13       1.2/ 3/   12       1.2/ 3/   12
   CO  SAMPLE METER/RANGE/PPM                94.9/ 3/ 2728      98.0/ 3/ 2857      79.2/ 3/ 1960      91.3/ 3/ 2503
   CO  BCKGRD METER/RANGE/PPM                  .8/ 3/    5        .6/ 3/   14        .3/ 3/    7        .6/ 3/   14
   CO2 SAMPLE METER/RANGE/PCT                78.7/ 3/ 1.44      46.7/ 3/  .80      64.2/ 3/ 1.25      46.4/ 3/  .80
   CO2 BCKGRD METER/RANGE/PCT                 4.1/ 3/  .06       4.3/ 3/  .07       4.4/ 3/  .07       4.6/ 3/  .07
   NOX SAMPLE METER/RANGE/PPM                44.4/ 2/   44       9.6/ 2/   10      30.9/ 2/   31      10.4/ 2/   10
   NOX BCKGRD METER/RANGE/PPM                 1.3/ 2/    1       1.0/ 2/    1        .8/ 2/    1        .8/ 2/    1
   DILUTION FACTOR                                7.72              12.15               9.20              12.55

   HC  CONCENTRATION PPM                          319                221                194                193
   CO  CONCENTRATION PPM                         2597               2747               1871               2403
   CO2 CONCENTRATION PCT                         1.39                .74               1.19                .73
   NOX CONCENTRATION PPM                         43.8                8.7               30.2                9.7
   HC  MASS GRAMS                               13.96              16.52               8.47              14.43
   CO  MASS GRAMS                              229.22             419.65             164.56             379.83
   CO2 MASS GRAMS                              1926.9             1763.8             1693.0             1740.4
   NOX MASS GRAMS                                6.26               2.18               4.30               2.37

   HC  GRAMS/KM                                  2.43               2.69               1.47               2.35
   CO  GRAMS/KM                                 39.90              67.90              28.55              61.86
   CO2 GRAMS/KM                                 335.7              286.8              295.1              283.5
   NOX GRAMS/KM                                  1.09                .35                .75                .39
   FUEL CONSUMPTION BY CB L/100KM               17.38              17.12              14.78              16.61

   RUN TIME                  SECONDS              505                867                505                867
   AVG. EXH. OXYGEN          PERCENT             3.99               5.41               4.51               6.12
   CATALYST AVG. TEMP.       DEG. C               307                374                333                388
   CATALYST MAX. TEMP.       DEG. C               461                438                448                444
   MEASURED DISTANCE         KM                  5.74               6.15               5.76               6.14
        DFC, WET (DRY)                                .900 ( .889)                          .910 ( .899)
        SCF, WET (DRY)                               1.000 ( .978)                         1.000 ( .979)
        VOL (SCM)                                           205.4                                 205.2
        KM  (MEASURED)                                      11.90                                 11.90
COMPOSITE RESULTS
   TEST NUMBER             145-31
   BAROMETER     MM HG     735.1      TOTAL FUEL SULFUR   MG/KM   35.10      CARBON DIOXIDE        G/KM      3-BAG      (4-BAG)
   HUMIDITY      G/KG       10.3      AVG. EXH. OXYGEN    PCT      5.30      FUEL CONSUMPTION      L/100KM   296.4      ( 295.4)
   TEMPERATURE   DEG C      22.8      CATALYST AVG. TEMP. DEG C     358      HYDROCARBONS (THC)    G/KM      16.38      ( 16.28)
                                      CATALYST MAX. TEMP. DEG C     461      CARBON MONOXIDE       G/KM       2.30      (  2.28)
                                                                             OXIDES OF NITROGEN    G/KM      50.98      ( 49.10)
                                                                                                               .61      (   .62)
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                         PVM - 145   SET   VEHICLE EMISSIONS RESULTS - NO AIR INJ. + R.O.I.
                                           PROJECT 11-4771-001

VEHICLE MODEL   78 FORD GRANADA               VEHICLE NO.    14                  TEST WEIGHT   1814 KG(  4000 LBS)
ENGINE 4.9 L(302 CID) V-8                     TRANSMISSION A3                    ACTUAL ROAD LOAD   9.8 KW( 13.2 HP)
                                              GVW  2113 KG(  4658 LBS)           GASOLINE  EM-344
   TEST NUMBER                                   145-32                   145-33
   TEST CYCLE                                     SET                      HFET
   RUN NUMBER                                      1                        1
   DATE                                         9/11/78                  9/11/78
   ODOMETER                               9307KM(  5783MILES)      9344KM(  5806MILES)
   CVS - BAG CART - DYNAMOMETER                 2 - 1 - 3                2 - 1 - 3

   TEMPERATURE DEG. C (DEG. F)                 23.3 / 74.0              24.4 / 76.0
   RELATIVE HUMIDITY, PCT                          58.1                     44.1
   BAROMETER, MM HG(IN HG)                    738.6 (29.08)            738.6 (29.08)
   RUN TIME, SECONDS                               1398                      766

   BLOWER DIF P MM. H2O(IN. H2O)              749.3 (29.5)             749.3 (29.5)
   BLOWER INLET P MM. H2O(IN. H2O)            749.3 (29.5)             749.3 (29.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)           43.3 (110.0)             43.3 (110.0)
   BLOWER REVOLUTIONS                             112776                    61854
   CVS FLOW STD. CU. METRES(SCF)             210.9 (7448.5)           115.7 (4085.5)
   HC  SAMPLE METER/RANGE/PPM                16.0/ 3/  160            65.2/ 2/   65
   HC  BCKGRD METER/RANGE/PPM                 1.1/ 3/   11            11.1/ 2/   11
   CO  SAMPLE METER/RANGE/PPM                62.9/ 3/ 1553            88.9/11/  364
   CO  BCKGRD METER/RANGE/PPM                  .9/ 3/    4             1.1/11/    3
   CO2 SAMPLE METER/RANGE/PCT                81.0/ 3/ 1.49            91.8/ 2/ 1.83
   CO2 BCKGRD METER/RANGE/PCT                 4.9/ 3/  .07             1.9/ 2/  .07
   NOX SAMPLE METER/RANGE/PPM                38.5/ 2/   38            61.2/ 2/   61
   NOX BCKGRD METER/RANGE/PPM                 1.5/ 2/    2             1.5/ 2/    2
   HC  CONCENTRATION PPM                          150                       56
   CO  CONCENTRATION PPM                         1471                      348
   CO2 CONCENTRATION PCT                         1.43                     1.77
   NOX CONCENTRATION PPM                         37.2                     59.4
   HC  MASS GRAMS                               18.24                     3.71
   CO  MASS GRAMS                              361.38                    46.89
   CO2 MASS GRAMS                              5527.2                   3759.9
   NOX MASS GRAMS                               15.08                    12.49
        DFC, WET (DRY)                      .877 ( .866)             .860 ( .853)
        SCF, WET (DRY)                     1.000 ( .974)            1.000 ( .975)
        VOL (SCM)                                 210.9                    115.7
        KM  (MEASURED)                            21.67                    16.18

   TEST NUMBER,             PVMT                 145-32                   145-33
   BAROMETER,               MM HG                 738.6                    738.6
   HUMIDITY,                G/KG                   10.7                      8.8
   TEMPERATURE,             DEG C                  23.3                     24.4
   TOTAL FUEL SULFUR,       MG/KM                 25.47                    21.74

   AVG. EXH. OXYGEN,        PCT                    4.01                     2.84
   CATALYST AVG. TEMP.,     DEG C                   463                      513
   CATALYST MAX. TEMP.,     DEG C                   558                      550
   CARBON DIOXIDE,          G/KM                  255.0                    232.3
   FUEL CONSUMPTION,        L/100KM               12.12                    10.14

   HYDROCARBONS,            G/KM                    .84                      .23
   CARBON MONOXIDE,         G/KM                  16.67                     2.90
   OXIDES OF NITROGEN,      G/KM                    .69                      .77
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TABLE E-49. TEST 151 EMISSIONS RESULTS

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                              PVM - 151   FTP  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                               PROJECT 11-4771-001

TEST NO.   151-11   RUN   1                 VEHICLE NO.    15                 TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL    78 FORD MUSTANG II         DATE    5/31/78                   ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
ENGINE 4.9 L(302 CID) V-8                   BAG CART NO.  1                   GASOLINE  EM-394
TRANSMISSION A3                             DYNO NO.      1                   ODOMETER    2028 KM(  1260 MILES)
GVW  1857 KG(  4095 LBS)                    CVS NO.       2

BAROMETER 740.66 MM HG(29.16 IN HG)         DRY BULB TEMP. 22.8 DEG C(73.0 DEG F)
RELATIVE HUMIDITY 59 PCT                    ABS. HUMIDITY  9.5 GM/KG          NOX HUMIDITY CORRECTION FACTOR   .96
BAG RESULTS
   BAG NUMBER                                      1                  2                   3                    4
   DESCRIPTION                              COLD TRANSIENT        STABILIZED        HOT TRANSIENT          STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)            762.0 (30.0)        762.0 (30.0)        762.0 (30.0)        762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)          762.0 (30.0)        762.0 (30.0)        762.0 (30.0)        762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)         43.9 (111.0)        43.3 (110.0)        43.9 (111.0)        43.3 (110.0)
   BLOWER REVOLUTIONS                           40744               69372               40658               69604
   CVS FLOW STD. CU. METRES(SCF)             76.2 (2691.7)      129.9 (4586.7)       76.0 (2685.6)      130.3 (4601.6)
   HC   SAMPLE METER/RANGE/PPM              15.9/ 3/  159       29.3/ 2/   29       57.5/ 2/   58       23.6/ 2/   24
   HC   BCKGRD METER/RANGE/PPM               2.0/ 3/   20       17.9/ 2/   18       16.5/ 2/   16       15.2/ 2/   15
   CO   SAMPLE METER/RANGE/PPM              34.9/ 3/  879       69.3/12/  144       88.3/12/  210       36.0/12/   77
   CO   BCKGRD METER/RANGE/PPM                .1/ 3/    2        1.0/12/    2         .7/12/    1         .6/12/    1
   CO2  SAMPLE METER/RANGE/PCT              47.8/ 3/ 1.84       65.4/ 3/ 1.17       91.0/ 3/ 1.70       60.4/ 3/ 1.08
   CO2  BCKGRD METER/RANGE/PCT               4.8/ 3/  .07        4.4/ 3/  .08        3.6/ 3/  .06        2.4/ 3/  .04
   NOX  SAMPLE METER/RANGE/PPM              95.4/ 2/   96       22.6/ 2/   23       42.0/ 2/   42       25.2/ 2/   25
   NOX  BCKGRD METER/RANGE/PPM                .4/ 2/    1         .6/ 2/    1         .7/ 2/    1         .7/ 2/    1
   DILUTION FACTOR                               6.98               11.28                7.77               12.29

   HC   CONCENTRATION PPM                         142                  13                  43                  10
   CO   CONCENTRATION PPM                         826                 137                 199                  73
   CO2  CONCENTRATION PCT                        1.78                1.10                1.65                1.04
   NOX  CONCENTRATION PPM                        95.1                22.1                41.4                24.6
   HC   MASS GRAMS                               6.29                 .97                1.89                 .72
   CO   MASS GRAMS                              73.33               20.71               17.58               11.13
   CO2  MASS GRAMS                             2482.8              2621.5              2299.2              2481.6
   NOX  MASS GRAMS                               6.33                5.27                5.79                5.89

   HC   GRAMS/KM                                 1.08                 .16                 .33                 .12
   CO   GRAMS/KM                                12.67                3.35                3.06                1.82
   CO2  GRAMS/KM                                428.8               423.3               399.7               405.1
   NOX  GRAMS/KM                                 1.09                 .85                1.01                 .96
   FUEL CONSUMPTION BY CB L/100KM               19.30               18.31               17.31               17.43

   RUN TIME                SECONDS                505                 867                 505                 867
   AVG. EXH. OXYGEN        PERCENT               3.30                6.35                1.95                3.05
   CATALYST AVG. TEMP.     DEG. C                 489                 539                 448                 523
   CATALYST MAX. TEMP.     DEG. C                 666                 619                 679                 606
   MEASURED DISTANCE       KM                    5.79                6.19                5.75                6.13
        DFC, WET (DRY)                                  .891 ( .881)                            .901 ( .891)
        SCF, WET (DRY)                                 1.000 ( .976)                           1.000 ( .977)
        VOL (SCM)                                             206.1                                    206.3
        KM  (MEASURED)                                        11.98                                    11.88

COMPOSITE RESULTS
   TEST NUMBER              151-11                                                                           3-BAG      (4-BAG)
   BAROMETER     MM HG       740.7    TOTAL FUEL SULFUR    MG/KM    39.10    CARBON DIOXIDE        G/KM      418.0     ( 412.6)
   HUMIDITY      G/KG          9.5    AVG. EXH. OXYGEN     PCT       5.35    FUEL CONSUMPTION      L/100KM   18.29     ( 17.98)
   TEMPERATURE   DEG C        22.8    CATALYST AVG. TEMP. DEG C       511    HYDROCARBONS (THC)    G/KM        .40     (   .38)
                                      CATALYST MAX. TEMP. DEG C       679    CARBON MONOXIDE       G/KM       5.20     (  4.76)
                                                                             OXIDES OF NITROGEN    G/KM        .94     (   .98)
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                              PVM - 151   SET  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                               PROJECT 11-4771-001

VEHICLE MODEL    78 FORD MUSTANG II         VEHICLE NO.     15                TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 4.9 L(302 CID) V-8                   TRANSMISSION A3                   ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
                                            GVW  1857 KG(  4095 LBS)          GASOLINE  EM-394

   TEST NUMBER                                   151-12                   151-13
   TEST CYCLE                                     SET                      HFET
   RUN NUMBER                                      1                        1
   DATE                                         5/31/78                  5/31/78
   ODOMETER                               2045KM(  1271MILES)      2066KM(  1284MILES)
   CVS - BAG CART - DYNAMOMETER              2 - 1 - 3                2 - 1 - 3

   TEMPERATURE DEG. C (DEG. F)              24.4 / 76.0              23.9 / 75.0
   RELATIVE HUMIDITY, PCT                      45.0                     47.8
   BAROMETER, MM HG(IN HG)                740.7 (29.16)            740.7 (29.16)
   RUN TIME, SECONDS                           1397                      765

   BLOWER DIF P MM. H2O(IN. H2O)           762.0 (30.0)             762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)         762.0 (30.0)             762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)        43.3 (110.0)             43.9 (111.0)
   BLOWER REVOLUTIONS                         112117                    61599
   CVS FLOW STD. CU. METRES(SCF)          209.9 (7412.2)           115.1 (4065.2)
   HC   SAMPLE METER/RANGE/PPM            35.6/ 2/   36            40.6/ 2/   41
   HC   BCKGRD METER/RANGE/PPM            16.0/ 2/   16            18.0/ 2/   18
   CO   SAMPLE METER/RANGE/PPM            96.1/13/   98            48.9/13/   46
   CO   BCKGRD METER/RANGE/PPM             1.3/13/    1             1.8/13/    2
   CO2  SAMPLE METER/RANGE/PCT            92.5/ 3/ 1.73            47.8/ 2/ 2.16
   CO2  BCKGRD METER/RANGE/PCT             4.4/ 3/  .07             1.8/ 2/  .07
   NOX  SAMPLE METER/RANGE/PPM            58.0/ 2/   58            79.6/ 2/   80
   NOX  BCKGRD METER/RANGE/PPM              .4/ 2/    1             1.0/ 2/    1
   HC   CONCENTRATION PPM                        22                       26
   CO   CONCENTRATION PPM                        92                       42
   CO2  CONCENTRATION PCT                      1.67                     2.10
   NOX  CONCENTRATION PPM                      57.2                     78.8
   HC   MASS GRAMS                             2.62                     1.69
   CO   MASS GRAMS                            22.51                     5.63
   CO2  MASS GRAMS                           6425.9                   4435.9
   NOX  MASS GRAMS                            21.68                    16.44
        DFC, WET (DRY)                   .070 ( .063)             .038 ( .031)
        SCF, WET (DRY)                  1.000 ( .976)            1.000 ( .971)
        VOL (SCM)                             209.9                    115.1
        KM  (MEASURED)                        21.56                    16.27

   TEST NUMBER,              PVMT             151-12                   151-13
   BAROMETER,                MM HG             740.7                    740.7
   HUMIDITY,                 G/KG                8.8                      9.1
   TEMPERATURE,              DEG C              24.4                     23.9
   TOTAL FUEL SULFUR,        MG/KM             27.44                    25.02

   AVG. EXH. OXYGEN,         PCT                2.95                     1.85
   CATALYST AVG. TEMP.,      DEG C               542                      581
   CATALYST MAX. TEMP.,      DEG C               652                      652
   CARBON DIOXIDE,           G/KM              298.0                    272.7
   FUEL CONSUMPTION,         L/100KM           12.81                    11.68

   HYDROCARBONS,             G/KM                .12                      .10
   CARBON MONOXIDE,          G/KM               1.04                      .35
   OXIDES OF NITROGEN,       G/KM               1.00                     1.01
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TABLE E-50. TEST 151 EMISSIONS RESULTS

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                          PVM - 151   FTP  VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
                                           PROJECT 11-4771-001

TEST NO.   151-21   RUN   1                 VEHICLE NO.      15                  TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL    78 FORD MUSTANG II         DATE     6/ 5/78                     ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
ENGINE 4.9 L(302 CID) V-8                   BAG CART NO.  1                      GASOLINE  EM-399
TRANSMISSION A3                             DYNO NO.      3                      ODOMETER    2403 KM(  1493 MILES)
GVW  1857 KG(  4095 LBS)                    CVS NO.       2

BAROMETER 740.66 MM HG(29.16 IN HG)         DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)
RELATIVE HUMIDITY 44 PCT                    ABS. HUMIDITY  9.9 GM/KG
BAG RESULTS                                                                      NOX HUMIDITY CORRECTION FACTOR   .98
  BAG NUMBER                                      1                   2                    3                    4
  DESCRIPTION                              COLD TRANSIENT        STABILIZED          HOT TRANSIENT          STABILIZED

  BLOWER DIF P MM. H2O(IN. H2O)            762.0 (30.0)         762.0 (30.0)         762.0 (30.0)         762.0 (30.0)
  BLOWER INLET P MM. H2O(IN. H2O)          762.0 (30.0)         762.0 (30.0)         762.0 (30.0)         762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)         43.3 (110.0)         43.3 (110.0)         43.9 (111.0)         43.3 (110.0)
  BLOWER REVOLUTIONS                          40551                69603                40606                69620
  CVS FLOW STD. CU. METRES(SCF)             75.9 (2681.1)       130.3 (4601.4)        75.9 (2682.2)       130.3 (4602.7)
  HC   SAMPLE METER/RANGE/PPM              30.9/ 3/  309        23.8/ 3/  238        25.0/ 3/  250        19.9/ 3/  199
  HC   BCKGRD METER/RANGE/PPM               2.9/ 3/   29         2.3/ 3/   23         2.2/ 3/   22         1.9/ 3/   19
  CO   SAMPLE METER/RANGE/PPM              95.9/ 3/ 2769        92.8/ 3/ 2643        76.7/ 3/ 2095        84.1/ 3/ 2308
  CO   BCKGRD METER/RANGE/PPM                .5/ 3/   11          .5/ 3/   11          .6/ 3/   14          .7/ 3/   16
  CO2  SAMPLE METER/RANGE/PCT              88.9/ 3/ 1.58        51.2/ 3/  .89        75.0/ 3/ 1.38        51.6/ 3/  .91
  CO2  BCKGRD METER/RANGE/PCT               4.3/ 3/  .07         4.9/ 3/  .08         4.7/ 3/  .07         5.0/ 3/  .08
  NOX  SAMPLE METER/RANGE/PPM              48.8/ 2/   46        19.5/ 2/   19        40.5/ 2/   40        16.6/ 2/   17
  NOX  BCKGRD METER/RANGE/PPM               1.9/ 2/    2         1.5/ 2/    2         1.2/ 2/    1         1.6/ 2/    1
  DILUTION FACTOR                               7.14                11.96                 8.36                11.74

  HC   CONCENTRATION PPM                        280                  217                  231                  182
  CO   CONCENTRATION PPM                       2631                 2595                 1997                 2218
  CO2  CONCENTRATION PCT                       1.53                  .82                 1.32                  .83
  NOX  CONCENTRATION PPM                       44.2                 13.1                 39.4                 15.5
  HC   MASS GRAMS                             12.63                16.31                10.10                13.65
  CO   MASS GRAMS                            232.50               386.15               172.19               336.53
  CO2  MASS GRAMS                            2120.2               1959.9               1839.8               1976.2
  NOX  MASS GRAMS                              6.25                 3.19                 5.69                 3.77

  HC   GRAMS/KM                                2.09                 2.66                 1.76                 2.23
  CO   GRAMS/KM                               38.48                63.08                30.06                55.08
  CO2  GRAMS/KM                               350.8                320.1                320.4                323.2
  NOX  GRAMS/KM                                1.03                  .52                  .99                  .62
  FUEL CONSUMPTION BY CB L/100KM              17.84                18.26                15.43                17.74

  RUN TIME                SECONDS               505                  867                  505                  867
  AVG. EXH. OXYGEN        PERCENT              3.45                 3.63                 4.00                 3.70
  CATALYST AVG. TEMP.     DEG. C                384                  444                  424                  444
  CATALYST MAX. TEMP.     DEG. C                588                  521                  576                  525
  MEASURED DISTANCE       KM                   6.04                 6.12                 5.73                 6.11
       DFC, WET (DRY)                                .893 ( .885)                              .902 ( .890)
       SCF, WET (DRY)                               1.000 ( .980)                             1.000 ( .981)
       VOL (SCM)                                          206.2                                     206.3
       KM  (MEASURED)                                     12.17                                     11.84

COMPOSITE RESULTS
  TEST NUMBER              151-21    TOTAL FUEL SULFUR   MG/KM   37.56                                 3-BAG        (4-BAG)
  BAROMETER       MM HG     740.7    AVG. EXH. OXYGEN    PCT      3.70    CARBON DIOXIDE      G/KM     326.8     ( 327.7)
  HUMIDITY        G/KG        9.9    CATALYST AVG. TEMP. DEG C     432    FUEL CONSUMPTION    L/100KM   17.52     ( 17.39)
  TEMPERATURE     DEG C      25.0    CATALYST MAX. TEMP. DEG C     588    HYDROCARBONS (THC)  G/KM      2.09     (  2.17)
                                                                          CARBON MONOXIDE     G/KM     48.73     ( 44.26)
                                                                          OXIDES OF NITROGEN  G/KM       .76     (   .78)


                          PVM - 151   SET  VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
                                           PROJECT 11-4771-001

VEHICLE MODEL    78 FORD MUSTANG II        VEHICLE NO.      15                    TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 4.9 L(302 CID) V-8                  TRANSMISSION A3                        ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
                                           GVW  1857 KG(  4095 LBS)               GASOLINE  EM-399
  TEST NUMBER                                 151-22                   151-23
  TEST CYCLE                                   SET                      HFET
  RUN NUMBER                                    1                        1
  DATE                                       6/ 5/78                  6/ 5/78
  ODOMETER                              2432KM(  1511MILES)      2453KM(  1524MILES)
  CVS - BAG CART - DYNAMOMETER               2 - 1 - 3                2 - 1 - 3

  TEMPERATURE DEG. C (DEG. F)              23.3 / 74.0              26.7 / 80.0
  RELATIVE HUMIDITY, PCT                      58.1                     44.9
  BAROMETER, MM HG(IN HG)                 740.2 (29.14)            740.2 (29.14)
  RUN TIME, SECONDS                           1347                      765

  BLOWER DIF P MM. H2O(IN. H2O)           762.0 (30.0)             762.0 (30.0)
  BLOWER INLET P MM. H2O(IN. H2O)         762.0 (30.0)             762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)        43.3 (110.0)             43.9 (111.0)
  BLOWER REVOLUTIONS                         112249                    61589
  CVS FLOW STD. CU. METRES(SCF)           210.0 (7415.5)           115.1 (4065.2)
  HC   SAMPLE METER/RANGE/PPM             16.1/ 3/  161            95.7/ 2/   96
  HC   BCKGRD METER/RANGE/PPM              1.9/ 3/   19            18.2/ 2/   18
  CO   SAMPLE METER/RANGE/PPM             58.9/ 3/ 1463            88.7/11/  410
  CO   BCKGRD METER/RANGE/PPM               .1/ 3/    2              .8/11/    2
  CO2  SAMPLE METER/RANGE/PCT             87.6/ 3/ 1.63            97.3/ 2/ 2.13
  CO2  BCKGRD METER/RANGE/PCT              4.8/ 3/  .06             1.9/ 2/  .07
  NOX  SAMPLE METER/RANGE/PPM             47.2/ 2/   47            72.8/ 2/   73
  NOX  BCKGRD METER/RANGE/PPM              1.2/ 2/    1             1.2/ 2/    1
  HC   CONCENTRATION PPM                       145                       78
  CO   CONCENTRATION PPM                      1388                      385
  CO2  CONCENTRATION PCT                      1.57                     2.07
  NOX  CONCENTRATION PPM                      46.2                     71.8
  HC   MASS GRAMS                            17.50                     5.21
  CO   MASS GRAMS                           339.36                    51.50
  CO2  MASS GRAMS                           6059.8                   4370.6
  NOX  MASS GRAMS                            18.52                    15.92
       DFC, WET (DRY)                   .867 ( .856)             .837 ( .831)
       SCF, WET (DRY)                  1.000 ( .973)            1.000 ( .972)
       VOL (SCM)                             210.0                    115.1
       KM  (MEASURED)                        21.69                    16.39

  TEST NUMBER,              PVMT            151-22                   151-23
  BAROMETER,                MM HG            740.2                    740.2
  HUMIDITY,                 G/KG              10.7                      9.9
  TEMPERATURE,              DEG C             23.3                     26.7
  TOTAL FUEL SULFUR,        MG/KM            28.00                    29.93

  AVG. EXH. OXYGEN,         PCT               2.55                     1.50
  CATALYST AVG. TEMP.,      DEG C              531                      572
  CATALYST MAX. TEMP.,      DEG C              661                      669
  CARBON DIOXIDE,           G/KM             279.7                    266.6
  FUEL CONSUMPTION,         L/100KM          13.10                    11.63

  HYDROCARBONS,             G/KM               .81                      .32
  CARBON MONOXIDE,          G/KM             15.68                     3.15
  OXIDES OF NITROGEN,       G/KM               .86                      .97
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TABLE E-51. TEST 151 EMISSIONS RESULTS

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                      PVM - 151   FTP  VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
                                       PROJECT 11-4771-001

TEST NO.   151-31   RUN   1                   VEHICLE NO.      15                   TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL    78 FORD MUSTANG II           DATE    6/ 6/78                       ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
ENGINE 4.9 L(302 CID) V-8                     BAG CART NO.  1                       GASOLINE  EM-399
TRANSMISSION A3                               DYNO NO.      3                       ODOMETER   2467 KM(  1533 MILES)
GVW  1857 KG(  4095 LBS)                      CVS NO.       2

BAROMETER 737.87 MM HG(29.05 IN HG)           DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)
RELATIVE HUMIDITY 55 PCT                      ABS. HUMIDITY 10.5 GM/KG              NOX HUMIDITY CORRECTION FACTOR   .99
BAG RESULTS
  BAG NUMBER                                        1                  2                  3                  4
  DESCRIPTION                                 COLD TRANSIENT      STABILIZED        HOT TRANSIENT       STABILIZED

  BLOWER DIF P MM. H2O(IN. H2O)               762.0 (30.0)       762.0 (30.0)      762.0 (30.0)       762.0 (30.0)
  BLOWER INLET P MM. H2O(IN. H2O)             762.0 (30.0)       762.0 (30.0)      762.0 (30.0)       762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)            43.9 (111.0)       43.9 (111.0)      43.9 (111.0)       43.3 (110.0)
  BLOWER REVOLUTIONS                              90655              69618             90689              69579
  CVS FLOW STD. CU. METRES(SCF)                75.9 (2679.9)     129.6 (4579.0)     75.8 (2676.6)     129.7 (4580.0)
  HC  SAMPLE METER/RANGE/PPM                  31.8/ 3/  318      21.9/ 3/  219     23.3/ 3/  233      19.6/ 3/  196
  HC  BCKGRD METER/RANGE/PPM                   1.5/ 3/   15       1.5/ 3/   15      1.3/ 3/   13       1.9/ 3/   19
  CO  SAMPLE METER/RANGE/PPM                  93.3/ 3/ 2663      87.8/ 3/ 2497     72.3/ 3/ 1897      49.6/ 2/ 2312
  CO  BCKGRD METER/RANGE/PPM                    .1/ 3/    2        .3/ 3/    7       .1/ 3/    2        .4/ 3/    9
  CO2 SAMPLE METER/RANGE/PCT                  79.5/ 3/ 1.96      50.0/ 3/  .87     79.8/ 3/ 1.36      50.9/ 3/  .88
  CO2 BCKGRD METER/RANGE/PCT                   4.2/ 3/  .06       4.0/ 3/  .06      2.7/ 3/  .04       3.0/ 3/  .06
  NOX SAMPLE METER/RANGE/PPM                  91.9/ 2/   92      15.1/ 2/   15     37.3/ 2/   37      15.5/ 2/   15
  NOX BCKGRD METER/RANGE/PPM                   1.8/ 2/    2       1.4/ 2/    1      1.0/ 2/    1       1.3/ 2/    1
  DILUTION FACTOR
                                                  7.68               11.91              8.55              11.89
  HC  CONCENTRATION PPM
  CO  CONCENTRATION PPM                            305                200                222                183
  CO2 CONCENTRATION PCT                           2639               2357               1812               2023
  NOX CONCENTRATION PPM                           1.90                .81               1.37                .83
  HC  MASS GRAMS                                  90.3               13.8               36.9               14.3
  CO  MASS GRAMS                                 13.32              19.47               9.68              13.70
  CO2 MASS GRAMS                                223.85             355.78             159.86             335.01
  NOX MASS GRAMS                                1995.8             1925.2             1890.2             1979.0
                                                  5.80               3.90               5.29               3.92
  HC  GRAMS/KM
  CO  GRAMS/KM                                    2.29               2.42               1.67               2.22
  CO2 GRAMS/KM                                   38.57              57.46              27.84              54.90
  NOX GRAMS/KM                                   335.3              310.9              318.3              319.8
  FUEL CONSUMPTION BY CB L/100KM                  1.00                .55                .91                .57
                                                 17.21              17.95              15.67              17.60
  RUN TIME              SECONDS
  AVG. EXH. OXYGEN      PERCENT                    505                867                506                867
  CATALYST AVG. TEMP.   DEG. C                    3.80               3.65               3.85               3.80
  CATALYST MAX. TEMP.   DEG. C                     381                451                441                459
  MEASURED DISTANCE     KM                         589                525                586                533
     DFC, WET (DRY)                               5.80               6.19               5.78               6.17
     SCF, WET (DRY)                                    .899 ( .889)                          .904 ( .890)
     VOL (SCM)                                        1.000 ( .979)                         1.000 ( .979)
     KM  (MEASURED)                                          205.4                                 205.5
                                                             12.00                                 11.95
COMPOSITE RESULTS
  TEST NUMBER               151-31                                                                    3-BAG         (4-BAG)
  BAROMETER     MM HG  737.9     TOTAL FUEL SULFUR    MG/KM    36.29     CARBON DIOXIDE      G/KM      318.0       ( 320.4)
  HUMIDITY      G/KG    10.5     AVG. EXH. OXYGEN     PCT       3.70     FUEL CONSUMPTION    L/100KM   16.91       ( 16.95)
  TEMPERATURE   DEG C   23.9     CATALYST AVG. TEMP. DEG C      438      HYDROCARBONS (THC)  G/KM       2.19       (  2.13)
                                 CATALYST MAX. TEMP. DEG C      589      CARBON MONOXIDE     G/KM      45.23       ( 44.41)
                                                                         OXIDES OF NITROGEN  G/KM        .79       (   .75)
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                      PVM - 151   SBT  VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
                                       PROJECT 11-4771-001

VEHICLE MODEL    78 FORD MUSTANG II           VEHICLE NO.      15                   TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 4.9 L(302 CID) V-8                     TRANSMISSION A3                       ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
                                              GVW  1857 KG(  4095 LBS)              GASOLINE  EM-399
  TEST NUMBER
  TEST CYCLE                                    151-32                     151-33
  RUN NUMBER                                     SET                        HFET
  DATE                                            1                          1
  ODOMETER                                      6/ 6/78                    6/ 6/78
  CVS - BAG CART - DYNAMOMETER              2485KM(  1544MILES)        2519KM(  1565MILES)
                                               2 - 1 - 3                  2 - 1 - 3
  TEMPERATURE DEG. C (DEG. F)
  RELATIVE HUMIDITY, PCT                       24.4 / 76.0                26.1 / 79.0
  BAROMETER, MM HG(IN HG)                         48.5                       43.8
  RUN TIME, SECONDS                          736.9 (29.01)              737.9 (29.05)
                                                  1397                        767
  BLOWER DIF P MM. H2O(IN. H2O)
  BLOWER INLET P MM. H2O(IN. H2O)             762.0 (30.0)               762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)           762.0 (30.0)               762.0 (30.0)
  BLOWER REVOLUTIONS                           43.9 (111.0)               44.4 (112.0)
  CVS FLOW STD. CU. METRES(SCF)                  112096                      61550
  HC  SAMPLE METER/RANGE/PPM                 208.4 (7361.6)             114.7 (4051.4)
  HC  BCKGRD METER/RANGE/PPM                 15.7/ 3/  157              87.1/ 2/   87
  CO  SAMPLE METER/RANGE/PPM                  1.3/ 3/   13              17.1/ 2/   17
  CO  BCKGRD METER/RANGE/PPM                 59.3/ 3/ 1990              85.9/11/  407
  CO2 SAMPLE METER/RANGE/PCT                   .1/ 3/    2               1.5/11/    5
  CO2 BCKGRD METER/RANGE/PCT                 88.7/ 3/ 1.65              97.6/ 2/ 2.15
  NOX SAMPLE METER/RANGE/PPM                  3.7/ 3/  .06               1.8/ 2/  .07
  NOX BCKGRD METER/RANGE/PPM                 44.6/ 2/   45              71.9/ 2/   71
  HC  CONCENTRATION PPM                        .8/ 2/    1               1.5/ 2/    2
  CO  CONCENTRATION PPM                           196                         73
  CO2 CONCENTRATION PCT                          1917                        381
  NOX CONCENTRATION PPM                          1.60                       2.09
  HC  MASS GRAMS                                 43.9                       70.1
  CO  MASS GRAMS                                17.52                       4.02
  CO2 MASS GRAMS                               393.99                      50.86
  NOX MASS GRAMS                               6119.5                     4397.3
     DFC, WET (DRY)                             16.86                      19.81
     SCF, WET (DRY)                          .865 ( .857)               .836 ( .830)
     VOL (SCM)                              1.000 ( .976)              1.000 ( .972)
     KM  (MEASURED)                             208.4                      114.7
                                                21.03                      16.96
  TEST NUMBER,           PVMT
  BAROMETER,             MM HG                  151-32                     151-33
  HUMIDITY,              G/KG                   736.9                      737.9
  TEMPERATURE,           DEG C                    9.6                        9.5
  TOTAL FUEL SULFUR,     MG/KM                   24.4                       26.1
                                                28.11                      24.96
  AVG. EXH. OXYGEN,      PCT
  CATALYST AVG. TEMP.,   DEG C                   2.60                       1.45
  CATALYST MAX. TEMP.,   DEG C                    590                        579
  CARBON DIOXIDE,        G/KM                     669                        669
  FUEL CONSUMPTION,      L/100KM                280.1                      267.1
                                                13.12                      11.65
  HYDROCARBONS,          G/KM
  CARBON MONOXIDE,       G/KM                     .80                        .29
  OXIDES OF NITROGEN,    G/KM                   15.76                       3.04
                                                  .77                        .90
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TABLE E-52. TEST 152 EMISSIONS RESULTS

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                         PVM - 152   FTP   VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                           PROJECT 11-4771-001

TEST NO.   152-11   RUN   1                  VEHICLE NO.   15                  TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 FORD MUSTANG II           DATE    7/20/78                   ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
ENGINE 4.9 L(302 CID) V-8                    BAG CART NO.  1                   GASOLINE  EM-399
TRANSMISSION A3                              DYNO NO.      3                   ODOMETER   4163 KM(  2587 MILES)
GVW  1857 KG(  4095 LBS)                     CVS NO.       2

BAROMETER 741.43 MM HG(29.19 IN HG)          DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)
RELATIVE HUMIDITY 45 PCT                     ABS. HUMIDITY  8.8 GM/KG          NOX HUMIDITY CORRECTION FACTOR   .94
BAG RESULTS
  BAG NUMBER                                       1                   2                    3                   4
  DESCRIPTION                                COLD TRANSIENT       STABILIZED         HOT TRANSIENT         STABILIZED

  BLOWER DIF P MM. H2O(IN. H2O)               762.0 (30.0)       762.0 (30.0)        762.0 (30.0)        762.0 (30.0)
  BLOWER INLET P MM. H2O(IN. H2O)             762.0 (30.0)       762.0 (30.0)        762.0 (30.0)        762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)            43.3 (110.0)       43.3 (110.0)        43.3 (110.0)        43.3 (110.0)
  BLOWER REVOLUTIONS                             40785              69627               40622               69575
  CVS FLOW STD. CU. METRES(SCF)               76.4 (2700.0)     130.3 (4601.0)      76.1 (2688.7)      130.4 (4605.0)
  HC  SAMPLE METER/RANGE/PPM                11.4/ 3/  114     18.9/ 2/   18      31.9/ 2/   32      16.5/ 2/   16
  HC  BCKGRD METER/RANGE/PPM                  .7/ 3/    7      8.5/ 2/    8       7.9/ 2/    7       7.8/ 2/    8
  CO  SAMPLE METER/RANGE/PPM                85.2/ 3/  589     73.0/13/   56      50.0/12/  110      33.6/12/   71
  CO  BCKGRD METER/RANGE/PPM                 1.9/ 3/   32     20.2/13/   19       6.9/12/   12       5.3/12/    9
  CO2 SAMPLE METER/RANGE/PCT                85.9/ 3/ 1.58     56.0/ 3/ 1.00      75.7/ 3/ 1.38      56.0/ 3/  .98
  CO2 BCKGRD METER/RANGE/PCT                 4.9/ 3/  .07      4.9/ 3/  .08       5.9/ 3/  .08       5.8/ 3/  .08
  NOX SAMPLE METER/RANGE/PPM                58.1/ 2/   52     26.1/ 2/   26      43.8/ 2/   44      27.7/ 2/   28
  NOX BCKGRD METER/RANGE/PPM                 1.6/ 2/    2      1.3/ 2/    1       1.3/ 2/    1       1.9/ 2/    1
  DILUTION FACTOR                                8.13              13.31                9.61               13.50

  HC  CONCENTRATION PPM                          108                 11                  25                   9
  CO  CONCENTRATION PPM                          531                 37                  95                  60
  CO2 CONCENTRATION PCT                         1.52                .93                1.31                 .91
  NOX CONCENTRATION PPM                         50.7               24.9                42.6                26.4
  HC  MASS GRAMS                                4.76                .79                1.11                 .70
  CO  MASS GRAMS                               47.22               5.61                8.46                9.16
  CO2 MASS GRAMS                              2131.7             2218.0              1821.1              2172.8
  NOX MASS GRAMS                                6.97               5.84                5.84                6.20

  HC  GRAMS/KM                                   .82                .13                 .19                 .11
  CO  GRAMS/KM                                  8.18                .90                1.47                1.48
  CO2 GRAMS/KM                                 369.3              356.3               316.7               351.6
  NOX GRAMS/KM                                  1.21                .94                1.02                1.00
  FUEL CONSUMPTION BY CB L/100KM               16.42              15.29               13.65               15.12

  RUN TIME                SECONDS                505                866                 505                 866
  AVG. EXH. OXYGEN        PERCENT               3.11               4.09                3.45                4.59
  CATALYST AVG. TEMP.     DEG. C                 401                491                 460                 487
  CATALYST MAX. TEMP.     DEG. C                 601                559                 601                 598
  MEASURED DISTANCE       KM                    5.77               6.23                5.75                6.18
      DFC, WET (DRY)                                  .907 ( .900)                          .915 ( .907)
      SCF, WET (DRY)                                 1.000 ( .981)                         1.000 ( .981)
      VOL (SCM)                                              206.7                                 206.5
      KM  (MEASURED)                                         12.00                                 11.93

COMPOSITE RESULTS
  TEST NUMBER            152-11       TOTAL FUEL SULFUR    MG/KM   32.38                                          3-BAG        (4-BAG)
  BAROMETER     MM HG    741.4        AVG. EXH. OXYGEN     PCT      3.95     CARBON DIOXIDE         G/KM        348.2       ( 346.8)
  HUMIDITY      G/KG       8.8        CATALYST AVG. TEMP, DEG C      470     FUEL CONSUMPTION       L/100KM     15.07       ( 15.02)
  TEMPERATURE   DEG C     24.4        CATALYST MAX. TEMP, DEG C      601     HYDROCARBONS (THC)     G/KM          .29       (   .29)
                                                                             CARBON MONOXIDE        G/KM         2.56       (  2.74)
                                                                             OXIDES OF NITROGEN     G/KM         1.02       (  1.03)



                         PVM - 152   SET   VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                           PROJECT 11-4771-001

VEHICLE MODEL   78 FORD MUSTANG II           VEHICLE NO.     15                TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 4.9 L(302 CID) V-8                    TRANSMISSION A3                   ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
                                             GVW  1857 KG(  4095 LBS)          GASOLINE  EM-399

  TEST NUMBER                                  152-12                 152-13
  TEST CYCLE                                    SET                    HFET
  RUN NUMBER                                     1                      1
  DATE                                        7/20/78                7/20/78                  /  /
  ODOMETER                               4192KM(  2605MILES)    4229KM(  2628MILES)
  CVS - BAG CART - DYNAMOMETER                2 - 1 - 3              2 - 1 - 3

  TEMPERATURE DEG. C (DEG. F)               26.1 / 79.0            27.2 / 81.0
  RELATIVE HUMIDITY, PCT                       40.6                   40.2
  BAROMETER, MM HG(IN HG)                 741.4 (29.19)          741.4 (29.19)
  RUN TIME, SECONDS                            1398                    766

  BLOWER DIF P MM. H2O(IN. H2O)           762.0 (30.0)           762.0 (30.0)
  BLOWER INLET P MM. H2O(IN. H2O)         762.0 (30.0)           762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)        43.3 (110.0)           43.3 (110.0)
  BLOWER REVOLUTIONS                         118211                  61922
  CVS FLOW STD. CU. METRES(SCF)          210.3 (7426.4)         115.1 (4065.1)
  HC  SAMPLE METER/RANGE/PPM             22.8/ 2/   23          22.5/ 2/   23
  HC  BCKGRD METER/RANGE/PPM              6.6/ 2/    7           7.0/ 2/    7
  CO  SAMPLE METER/RANGE/PPM             61.1/13/   59          61.0/13/   49
  CO  BCKGRD METER/RANGE/PPM              5.0/13/    6           1.9/13/    1
  CO2 SAMPLE METER/RANGE/PCT             80.0/ 3/ 1.65          96.9/ 2/ 2.08
  CO2 BCKGRD METER/RANGE/PCT              5.0/ 3/  .08           1.9/ 2/  .05
  NOX SAMPLE METER/RANGE/PPM             55.5/ 2/   55          69.3/ 2/   69
  NOX BCKGRD METER/RANGE/PPM               .9/ 2/    1           1.3/ 2/    1
  HC  CONCENTRATION PPM                        17                     17
  CO  CONCENTRATION PPM                        52                     45
  CO2 CONCENTRATION PCT                       1.59                   2.04
  NOX CONCENTRATION PPM                       54.7                   68.2
  HC  MASS GRAMS                              2.06                   1.10
  CO  MASS GRAMS                             12.67                   6.06
  CO2 MASS GRAMS                            6106.1                 4297.9
  NOX MASS GRAMS                             20.68                  15.23
      DFC, WET (DRY)                     .876 ( .870)           .844 ( .836)
      SCF, WET (DRY)                    1.000 ( .978)          1.000 ( .972)
      VOL (SCM)                              210.3                  115.1
      KM  (MEASURED)                         21.69                  16.30

  TEST NUMBER,           PVMT               152-12                 152-13
  BAROMETER,             MM HG               741.4                  741.4
  HUMIDITY,              G/KG                  8.8                   11.1
  TEMPERATURE,           DEG C                26.1                   27.2
  TOTAL FUEL SULFUR,     MG/KM               25.86                  29.19

  AVG. EXH. OXYGEN,      PCT                  3.04                   1.21
  CATALYST AVG. TEMP.,   DEG C                 564                    623
  CATALYST MAX. TEMP.,   DEG C                 661                    696
  CARBON DIOXIDE,        G/KM                281.5                  263.7
  FUEL CONSUMPTION,      L/100KM             12.07                  11.29

  HYDROCARBONS,          G/KM                  .10                    .07
  CARBON MONOXIDE,       G/KM                  .58                    .37
  OXIDES OF NITROGEN,    G/KM                  .95                    .93
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TABLE E-53. TEST 152 EMISSIONS RESULTS

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                           PVM - 152   FTP  VEHICLE EMISSIONS RESULTS - IGNITION MISFIRE
                                              PROJECT 11-4771-001

TEST NO.   152-21   RUN   1                VEHICLE NO.   15                     TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 FORD MUSTANG II         DATE    7/26/78                      ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
ENGINE 4.9 L(302 CID) V-8                  BAG CART NO.  1                      GASOLINE  EM-399
TRANSMISSION A3                            DYNO NO.      3                      ODOMETER   4609 KM(  2864 MILES)
GVW  1857 KG(  4095 LBS)                   CVS NO.       2

BAROMETER 743.46 MM HG(29.27 IN HG)        DRY BULB TEMP. 21.7 DEG C(71.0 DEG F)
RELATIVE HUMIDITY 56 PCT                   ABS. HUMIDITY  9.3 GM/KG             NOX HUMIDITY CORRECTION FACTOR   .96
BAG RESULTS
   BAG NUMBER                                     1                  2                  3                  4
   DESCRIPTION                             COLD TRANSIENT      STABILIZED        HOT TRANSIENT       STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)           774.7 (30.5)       774.7 (30.5)       774.7 (30.5)       774.7 (30.5)
   BLOWER INLET P MM. H2O(IN. H2O)         774.7 (30.5)       774.7 (30.5)       774.7 (30.5)       774.7 (30.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)        43.3 (110.0)       43.3 (110.0)       43.3 (110.0)       43.3 (110.0)
   BLOWER REVOLUTIONS                          40720              69670              40652              69689
   CVS FLOW STD. CU. METRES(SCF)           76.4 (2698.7)     130.7 (4616.9)      76.3 (2694.2)     130.6 (4610.2)
   HC  SAMPLE METER/RANGE/PPM             71.5/ 3/  715      38.3/ 2/   38      19.6/ 3/  196      30.3/ 2/   30
   HC  BCKGRD METER/RANGE/PPM               .8/ 3/    8       9.3/ 2/    9        .8/ 3/    8       7.8/ 2/    8
   CO  SAMPLE METER/RANGE/PPM             39.2/ 3/  806      47.1/12/  103      85.7/12/  202      59.4/13/   48
   CO  BCKGRD METER/RANGE/PPM               .9/ 3/   20      13.5/12/   26      17.5/12/   39      23.0/13/   21
   CO2 SAMPLE METER/RANGE/PCT             87.9/ 3/ 1.62      60.2/ 3/ 1.07      82.7/ 3/ 1.53      57.9/ 3/ 1.02
   CO2 BCKGRD METER/RANGE/PCT              3.0/ 3/  .05       4.0/ 3/  .06       3.6/ 3/  .06       2.9/ 3/  .05
   NOX SAMPLE METER/RANGE/PPM             60.5/ 2/   60      35.9/ 2/   36      45.8/ 2/   46      39.1/ 2/   39
   NOX BCKGRD METER/RANGE/PPM              1.6/ 2/    2       1.5/ 2/    2       1.5/ 2/    2       1.9/ 2/    2
   DILUTION FACTOR                             7.56              12.40               8.59              13.08

   HC  CONCENTRATION PPM                       708                 30                189                 23
   CO  CONCENTRATION PPM                       749                 76                162                 27
   CO2 CONCENTRATION PCT                       1.58               1.01               1.48                .98
   NOX CONCENTRATION PPM                       59.1               34.5               44.5               38.3
   HC  MASS GRAMS                              31.20              2.29               6.11               1.79
   CO  MASS GRAMS                              66.62             11.58              14.42               4.10
   CO2 MASS GRAMS                             2216.4            2414.0             2063.3             2347.6
   NOX MASS GRAMS                              8.26               8.25               6.20               7.73

   HC  GRAMS/KM                                5.37                .36               1.06                .28
   CO  GRAMS/KM                               11.46               1.86               2.49                .66
   CO2 GRAMS/KM                               381.3              388.7              356.3              379.5
   NOX GRAMS/KM                                1.42               1.33               1.07               1.25
   FUEL CONSUMPTION BY CB L/100KM             17.77              16.76              15.52              16.28

   RUN TIME                 SECONDS            506                867                505                867
   AVG. EXH. OXYGEN         PERCENT            0.00               3.80               3.20               4.04
   CATALYST AVG. TEMP.      DEG. C             -18                638                599                639
   CATALYST MAX. TEMP.      DEG. C             -18                687                734                695
   MEASURED DISTANCE        KM                 5.81               6.22               5.79               6.19
        DFC, WET (DRY)                                .900 ( .890)                          .909 ( .898)
        SCF, WET (DRY)                               1.000 ( .976)                         1.000 ( .977)
        VOL (SCM)                                        207.1                                 207.0
        KM  (MEASURED)                                   12.03                                 11.98

 COMPOSITE RESULTS                                                                                      3-BAG          (4-BAG)
   TEST NUMBER             152-21          TOTAL FUEL SULFUR   MG/KM    35.69        CARBON DIOXIDE        G/KM       378.3         ( 375.6)
   BAROMETER     MM HG     743.5           AVG. EXH. OXYGEN    PCT       3.07        FUEL CONSUMPTION      L/100KM    16.63         ( 16.49)
   HUMIDITY      G/KG        9.3           CATALYST AVG. TEMP. DEG C      525        HYDROCARBONS (THC)    G/KM        1.54         (  1.57)
   TEMPERATURE   DEG C      21.7           CATALYST MAX. TEMP. DEG C      734        CARBON MONOXIDE       G/KM        4.03         (  3.68)
                                                                                      OXIDES OF NITROGEN    G/KM        1.28         (  1.25)
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                           PVM - 152   SET  VEHICLE EMISSIONS RESULTS - IGNITION MISFIRE
                                              PROJECT 11-4771-001

                                           VEHICLE NO.      15                  TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 FORD MUSTANG II         TRANSMISSION A3                      ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
ENGINE 4.9 L(302 CID) V-8                  GVW  1857 KG(  4095 LBS)             GASOLINE  EM-399

   TEST NUMBER                                  152-22                  152-23
   TEST CYCLE                                    SET                     HFET
   RUN NUMBER                                     1                       1
   DATE                                        7/26/78                 7/26/78                 /  /
   ODOMETER                               4632KM(  2878MILES)     4669KM(  2901MILES)
   CVS - BAG CART - DYNAMOMETER                2 - 1 - 3               2 - 1 - 3

   TEMPERATURE DEG. C (DEG. F)               25.6 / 78.0             27.8 / 82.0
   RELATIVE HUMIDITY, PCT                       67.4                    76.1
   BAROMETER, MM HG(IN HG)                  740.7 (29.16)           740.7 (29.16)
   RUN TIME, SECONDS                            1396                     765

   BLOWER DIF P MM. H2O(IN. H2O)            774.7 (30.5)            774.7 (30.5)
   BLOWER INLET P MM. H2O(IN. H2O)          774.7 (30.5)            774.7 (30.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)         43.3 (110.0)            44.4 (112.0)
   BLOWER REVOLUTIONS                          112192                   61503
   CVS FLOW STD. CU. METRES(SCF)            209.5 (7400.5)          119.7 (4051.2)
   HC  SAMPLE METER/RANGE/PPM               10.3/ 3/  103           78.6/ 2/   79
   HC  BCKGRD METER/RANGE/PPM                 .3/ 3/    3           10.0/ 2/   10
   CO  SAMPLE METER/RANGE/PPM               88.6/12/  211           89.0/13/   62
   CO  BCKGRD METER/RANGE/PPM                4.1/12/    7            6.0/13/    6
   CO2 SAMPLE METER/RANGE/PCT               39.6/ 2/ 1.72           47.9/ 2/ 2.14
   CO2 BCKGRD METER/RANGE/PCT                1.6/ 2/  .06            1.9/ 2/  .05
   NOX SAMPLE METER/RANGE/PPM               68.2/ 2/   68           32.3/ 3/   97
   NOX BCKGRD METER/RANGE/PPM                1.1/ 2/    1             .5/ 3/    2
   HC  CONCENTRATION PPM                        97                      70
   CO  CONCENTRATION PPM                        193                     53
   CO2 CONCENTRATION PCT                        1.67                    2.09
   NOX CONCENTRATION PPM                        67.2                    95.6
   HC  MASS GRAMS                               11.71                   4.69
   CO  MASS GRAMS                               47.19                   7.19
   CO2 MASS GRAMS                               6402.6                  4399.0
   NOX MASS GRAMS                               30.46                   28.11
        DFC, WET (DRY)                       .869 ( .856)            .890 ( .829)
        SCF, WET (DRY)                      1.000 ( .969)           1.000 ( .962)
        VOL (SCM)                               209.5                   119.7
        KM  (MEASURED)                          21.89                   16.28

   TEST NUMBER,            PVM1                152-22                  152-23
   BAROMETER,              MM HG                740.7                   740.7
   HUMIDITY,               G/KG                 14.2                    18.4
   TEMPERATURE,            DEG C                25.6                    27.8
   TOTAL FUEL SULFUR,      MG/KM                27.22                   29.86

   AVG. EXH. OXYGEN,       PCT                  2.81                    1.58
   CATALYST AVG. TEMP.,    DEG C                693                     738
   CATALYST MAX. TEMP.,    DEG C                782                     787
   CARBON DIOXIDE,         G/KM                 292.5                   270.2
   FUEL CONSUMPTION,       L/100KM              12.70                   11.60

   HYDROCARBONS,           G/KM                  .53                     .29
   CARBON MONOXIDE,        G/KM                 2.16                     .44
   OXIDES OF NITROGEN,     G/KM                 1.39                    1.73
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TABLE E-54. TEST 152 EMISSIONS RESULTS

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                         PVM - 152   FTP   VEHICLE EMISSIONS RESULTS - IGNITION MISFIRE
                                                PROJECT 11-4771-001

TEST NO.   152-31    RUN   1
VEHICLE MODEL    78 FORD MUSTANG II           VEHICLE NO.   15
ENGINE 4.9 L(302 CID) V-8                     DATE     7/27/78                  TEST WEIGHT    1588 KG(  3500 LBS)
TRANSMISSION A3                               BAG CART NO.  1                   ACTUAL ROAD LOAD    9.2 KW( 12.3 HP)
GVW  1857 KG(  4095 LBS)                      DYNO NO.      3                   GASOLINE  EM-399
                                              CVS NO.       2                   ODOMETER    4685 KM(  2911 MILES)
BAROMETER 739.90 MM HG(29.13 IN HG)
RELATIVE HUMIDITY 59 PCT                      DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)
BAG RESULTS                                   ABS. HUMIDITY 10.0 GM/KG
  BAG NUMBER                                                                    NOX HUMIDITY CORRECTION FACTOR   .98
  DESCRIPTION
                                                    1                  2                    3                  4
                                              COLD TRANSIENT      STABILIZED          HOT TRANSIENT       STABILIZED
  BLOWER DIF P MM. H2O(IN. H2O)
  BLOWER INLET P MM. H2O(IN. H2O)             749.3 (29.5)        749.3 (29.5)        749.3 (29.5)
  BLOWER INLET TEMP. DEG. C(DEG. F)           749.3 (29.5)        749.3 (29.5)        749.3 (29.5)        749.3 (29.5)
  BLOWER REVOLUTIONS                           43.3 (110.0)        42.8 (109.0)        42.8 (109.0)       749.3 (29.5)
  CVS FLOW STD. CU. METRES(SCF)                  40701               70185               40631             43.3 (110.0)
  HC  SAMPLE METER/RANGE/PPM                 76.2 (2693.0)      131.6 (4649.8)       76.2 (2690.0)          69616
  HC  BCKGRD METER/RANGE/PPM                 74.5/ 3/ 745        39.3/ 2/  39        19.2/ 3/ 192       130.4 (4606.1)
  CO  SAMPLE METER/RANGE/PPM                  1.0/ 3/  10        11.0/ 2/  11          .4/ 3/   4        33.3/ 2/  33
  CO  BCKGRD METER/RANGE/PPM                 33.6/ 3/ 791        38.7/12/  69        75.9/12/ 179        11.0/ 2/  11
  CO2 SAMPLE METER/RANGE/PCT                   .6/ 3/  19         6.9/12/  12         4.3/12/   8        43.7/13/  38
  CO2 BCKGRD METER/RANGE/PCT                 87.1/ 3/ 1.62       60.9/ 3/ 1.07       82.8/ 3/ 1.53        8.3/13/   8
  NOX SAMPLE METER/RANGE/PPM                  4.3/ 3/  .07        4.9/ 3/  .07        4.8/ 3/  .07       59.3/ 3/ 1.05
  NOX BCKGRD METER/RANGE/PPM                 59.0/ 2/  59        30.9/ 2/  30        46.9/ 2/  46         4.4/ 3/  .07
  DILUTION FACTOR                             1.0/ 2/   1          .7/ 2/   1          .9/ 2/   1        36.9/ 2/  37
                                                 7.50               12.40                8.60               .8/ 2/   1
  HC  CONCENTRATION PPM                                                                                    12.64
  CO  CONCENTRATION PPM                          736                 29                 139
  CO2 CONCENTRATION PCT                          791                 56                 159                  23
  NOX CONCENTRATION PPM                         1.56                1.01                1.46                 29
  HC  MASS GRAMS                                58.1                29.8                45.6                 .99
  CO  MASS GRAMS                               32.38                1.84                5.89                36.2
  CO2 MASS GRAMS                               65.77                8.61               19.09                1.79
  NOX MASS GRAMS                              2178.5              2432.0              2090.6                4.41
                                                8.28                7.32                6.44              4356.7
  HC  GRAMS/KM                                                                                              6.81
  CO  GRAMS/KM                                  5.72                 .30                1.03
  CO2 GRAMS/KM                                 11.62                1.41                2.96                 .28
  NOX GRAMS/KM                                 384.8               397.3               355.4                 .71
  FUEL CONSUMPTION BY CB L/100KM                1.46                1.20                1.13               388.5
                                               17.98               17.04               15.44                1.02
  RUN TIME                  SECONDS                                                                        16.33
  AVG. EXH. OXYGEN          PERCENT              506                 866                 506
  CATALYST AVG. TEMP.       DEG. C              3.44                3.80                3.19                 865
  CATALYST MAX. TEMP.       DEG. C               469                 638                 582                4.09
  MEASURED DISTANCE         KM                   708                 687                 726                 635
       DFC, WET (DRY)                           5.66                6.12                5.73                 687
       SCF, WET (DRY)                                                                                       6.14
       VOL (SCM)                                       .901 ( .891)                            .907 ( .897)
       KM  (MEASURED)                                 1.000 ( .977)                           1.000 ( .978)
                                                              297.9                                   206.6
COMPOSITE RESULTS                                             11.78                                   11.93
  TEST NUMBER
  BAROMETER        MM HG    152-31    TOTAL FUEL SULFUR   MG/KM    36.08
  HUMIDITY         G/KG     739.9     AVG. EXH. OXYGEN    PCT       3.62     CARBON DIOXIDE         G/KM        3-BAG       (4-BAG)
  TEMPERATURE      DEG C     10.0     CATALYST AVG. TEMP. DEG C      648     FUEL CONSUMPTION       L/100KM     383.3      ( 378.4)
                             23.3     CATALYST MAX. TEMP. DEG C      726     HYDROCARBONS (THC)     G/KM        16.43      ( 16.61)
                                                                             CARBON MONOXIDE        G/KM         1.08      (  1.61)
                                                                             OXIDES OF NITROGEN     G/KM         3.01      (  3.60)
                                                                                                                 1.43      (  1.30)
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                         PVM - 152   SBT   VEHICLE EMISSIONS RESULTS - IGNITION MISFIRE
                                                PROJECT 11-4771-001

VEHICLE MODEL    78 FORD MUSTANG II           VEHICLE NO.      15
ENGINE 4.9 L(302 CID) V-8                     TRANSMISSION A3                    TEST WEIGHT    1588 KG(  3500 LBS)
                                              GVW  1857 KG(  4095 LBS)           ACTUAL ROAD LOAD    9.2 KW( 12.3 HP)
  TEST NUMBER                                                                    GASOLINE  EM-399
  TEST CYCLE                                     152-32
  RUN NUMBER                                      SET                  152-33
  DATE                                             1                    HFET
  ODOMETER                                      7/27/78                   1
  CVS - BAG CART - DYNAMOMETER              4719KM(  2924MILES)        7/27/78
                                                2 - 1 - 3          4749KM(  2951MILES)                  / /
  TEMPERATURE DEG. C (DEG. F)                                          2 - 1 - 3
  RELATIVE HUMIDITY, PCT                      22.8 / 73.0
  BAROMETER, MM HG(IN HG)                         61.9               24.9 / 76.8
  RUN TIME, SECONDS                          739.9 (29.13)               38.9
                                                  1398               739.9 (29.13)
  BLOWER DIF P MM. H2O(IN. H2O)                                           765
  BLOWER INLET P MM. H2O(IN. H2O)            749.3 (29.5)
  BLOWER INLET TEMP. DEG. C(DEG. F)          749.3 (29.5)             749.3 (29.5)
  BLOWER REVOLUTIONS                          43.3 (110.0)            749.3 (29.5)
  CVS FLOW STD. CU. METRES(SCF)                 112201                 43.3 (110.0)
  HC  SAMPLE METER/RANGE/PPM                210.2 (7422.8)               61430
  HC  BCKGRD METER/RANGE/PPM                  9.3/ 3/  93            115.1 (4064.1)
  CO  SAMPLE METER/RANGE/PPM                   .4/ 3/   4             77.3/ 2/  77
  CO  BCKGRD METER/RANGE/PPM                  70.5/12/ 160            11.0/ 2/  11
  CO2 SAMPLE METER/RANGE/PCT                   9.5/12/   8            75.0/13/  57
  CO2 BCKGRD METER/RANGE/PCT                  38.9/ 2/ 1.68            9.0/13/   4
  NOX SAMPLE METER/RANGE/PPM                   1.5/ 2/  .05           46.7/ 2/ 2.10
  NOX BCKGRD METER/RANGE/PPM                  67.5/ 2/  68             1.7/ 2/  .06
  HC  CONCENTRATION PPM                        1.1/ 2/   1            89.2/ 3/  88
  CO  CONCENTRATION PPM                            85                   .6/ 3/   2
  CO2 CONCENTRATION PCT                           199                       68
  NOX CONCENTRATION PPM                          1.64                       46
  HC  MASS GRAMS                                 66.5                     2.05
  CO  MASS GRAMS                                10.32                     86.1
  CO2 MASS GRAMS                                35.39                     9.52
  NOX MASS GRAMS                               6299.4                     6.21
       DFC, WET (DRY)                           26.43                   4311.4
       SCF, WET (DRY)                       .873 ( .861)                 17.14
       VOL (SCM)                           1.000 ( .971)              .892 ( .837)
       KM  (MEASURED)                           210.2                1.000 ( .975)
                                                21.05                    115.1
  TEST NUMBER,           PVMT                                            16.24
  BAROMETER,             MM HG                 152-32
  HUMIDITY,              G/KG                   739.9                   152-33
  TEMPERATURE,           DEG C                   10.9                    739.9
  TOTAL FUEL SULFUR,     MG/KM                   22.8                      7.5
                                                26.72                     24.9
  AVG. EXH. OXYGEN,      PCT                                             24.34
  CATALYST AVG. TEMP.,   DEG C                   2.91
  CATALYST MAX. TEMP.,   DEG C                    681                     1.64
  CARBON DIOXIDE,        G/KM                     764                      731
  FUEL CONSUMPTION,      L/100KM                288.1                      787
                                                12.47                    264.6
  HYDROCARBONS,          G/KM                                            11.36
  CARBON MONOXIDE,       G/KM                     .47
  OXIDES OF NITROGEN,    G/KM                    1.62                      .28
                                                 1.23                      .30
                                                                          1.05
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TABLE E-55. TEST 153 EMISSIONS RESULTS

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                        PVM - 153   FTP  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                         PROJECT 11-4771-001

TEST NO.   153-11   RUN   1                  VEHICLE NO.   15                 TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 FORD MUSTANG II           DATE    8/11/78                  ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
ENGINE 4.9 L(302 CID) V-8                    BAG CART NO.  1                  GASOLINE  EM-399
TRANSMISSION A3                              DYNO NO.      3                  ODOMETER   6381 KM(  3965 MILES)
GVW  1857 KG(  4095 LBS)                     CVS NO.       2

BAROMETER 740.66 MM HG(29.16 IN HG)          DRY BULB TEMP. 21.7 DEG C(71.0 DEG F)
RELATIVE HUMIDITY 69 PCT                     ABS. HUMIDITY 10.7 GM/KG
BAG RESULTS                                                                   NOX HUMIDITY CORRECTION FACTOR  1.00
  BAG NUMBER                                      1                2                 3                  4
  DESCRIPTION                              COLD TRANSIENT      STABILIZED      HOT TRANSIENT        STABILIZED

  BLOWER DIF P MM. H2O(IN. H2O)            749.3 (29.5)     749.3 (29.5)      749.3 (29.5)      749.3 (29.5)
  BLOWER INLET P MM. H2O(IN. H2O)          749.3 (29.5)     749.3 (29.5)      749.3 (29.5)      749.3 (29.5)
  BLOWER INLET TEMP. DEG. C(DEG. F)         43.3 (110.0)     43.3 (110.0)      43.9 (111.0)      43.3 (110.0)
  BLOWER REVOLUTIONS                           40717            69568             40715             69556
  CVS FLOW STD. CU. METRES(SCF)             76.4 (2697.2)   130.5 (4608.0)     76.3 (2694.3)    130.4 (4607.0)
  HC  SAMPLE METER/RANGE/PPM               15.9/ 3/  159    19.3/ 2/   19     43.2/ 2/   43     17.6/ 2/   18
  HC  BCKGRD METER/RANGE/PPM                1.3/ 3/   13    10.9/ 2/   11     10.8/ 2/   11     10.2/ 2/   10
  CO  SAMPLE METER/RANGE/PPM               37.9/ 3/  900    83.9/13/   60     60.9/12/  135     62.2/13/   50
  CO  BCKGRD METER/RANGE/PPM                1.2/ 3/   27    19.9/13/   14      5.3/12/    9      8.7/13/    8
  CO2 SAMPLE METER/RANGE/PCT               87.3/ 3/ 1.62    59.2/ 3/  .95     70.7/ 3/ 1.28     55.0/ 3/  .96
  CO2 BCKGRD METER/RANGE/PCT                3.9/ 3/  .06     3.9/ 3/  .06      4.6/ 3/  .07      4.6/ 3/  .07
  NOX SAMPLE METER/RANGE/PPM               59.9/ 2/   59    26.5/ 2/   26     40.6/ 2/   41     27.9/ 2/   28
  NOX BCKGRD METER/RANGE/PPM                1.5/ 2/    2     1.2/ 2/    1      1.1/ 2/    1      1.0/ 2/    1
  DILUTION FACTOR                               7.78            14.01             10.39             13.80

  HC  CONCENTRATION PPM                          148                9                33                 8
  CO  CONCENTRATION PPM                          838               91               120                40
  CO2 CONCENTRATION PCT                         1.57              .89              1.21               .90
  NOX CONCENTRATION PPM                         53.1             25.9              39.6              27.0
  HC  MASS GRAMS                                6.50              .69              1.97               .61
  CO  MASS GRAMS                               73.82             6.25             10.69              6.11
  CO2 MASS GRAMS                              2195.0           2133.8            1696.7            2150.2
  NOX MASS GRAMS                                7.75             6.33              5.78              6.73

  HC  GRAMS/KM                                  1.13              .11               .26               .10
  CO  GRAMS/KM                                 12.87             1.03              1.87              1.00
  CO2 GRAMS/KM                                 382.7            351.6             296.0             351.3
  NOX GRAMS/KM                                  1.35             1.09              1.01              1.10
  FUEL CONSUMPTION BY CB L/100KM               17.35            15.09             12.79             15.07

  RUN TIME               SECONDS                 505              865               506               866
  AVG. EXH. OXYGEN       PERCENT                2.99             3.69              3.32              4.06
  CATALYST AVG. TEMP.    DEG. C                  399              459               408               457
  CATALYST MAX. TEMP.    DEG. C                  538              516               542               508
  MEASURED DISTANCE      KM                     5.74             6.07              5.73              6.12
      DFC, WET (DRY)                                  .908 ( .899)                       .919 ( .905)
      SCF, WET (DRY)                                 1.000 ( .975)                      1.000 ( .976)
      VOL (SCM)                                              206.8                             206.7
      KM  (MEASURED)                                         11.80                             11.85

COMPOSITE RESULTS
  TEST NUMBER              153-11                                                                      3-BAG      (4-BAG)
  BAROMETER     MM HG      740.7     TOTAL FUEL SULFUR   MG/KM    25.37   CARBON DIOXIDE       G/KM    392.7     ( 392.7)
  HUMIDITY      G/KG        10.7     AVG. EXH. OXYGEN    PCT       3.42   FUEL CONSUMPTION     L/100KM  14.93    ( 14.92)
  TEMPERATURE   DEG C       21.7     CATALYST AVG. TEMP. DEG C      431   HYDROCARBONS (THC)   G/KM       .37    (   .36)
                                     CATALYST MAX. TEMP. DEG C      592   CARBON MONOXIDE      G/KM      3.74    (  3.73)
                                                                          OXIDES OF NITROGEN   G/KM      1.10    (  1.11)
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                        PVM - 153   SBT  VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                         PROJECT 11-4771-001

VEHICLE MODEL   78 FORD MUSTANG II           VEHICLE NO.    15                TEST WEIGHT   1588 KG(  3500 LBS)
ENGINE 4.9 L(302 CID) V-8                    TRANSMISSION A3                  ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
                                             GVW  1857 KG(  4095 LBS)         GASOLINE  EM-399

  TEST NUMBER                                  153-12                153-13
  TEST CYCLE                                    SET                   HFET
  RUN NUMBER                                     1                     1
  DATE                                        8/11/78               8/11/78
  ODOMETER                              6408KM(  3982MILES)    6445KM(  4005MILES)
  CVS - BAG CART - DYNAMOMETER               2 - 1 - 3             2 - 1 - 3

  TEMPERATURE DEG. C (DEG. F)               22.8 / 73.0           22.8 / 73.0
  RELATIVE HUMIDITY, PCT                       50.1                  50.1
  BAROMETER, MM HG(IN HG)                  740.9 (29.17)         740.9 (29.17)
  RUN TIME, SECONDS                            1396                   766

  BLOWER DIF P MM. H2O(IN. H2O)            749.3 (29.5)          749.3 (29.5)
  BLOWER INLET P MM. H2O(IN. H2O)          749.3 (29.5)          749.3 (29.5)
  BLOWER INLET TEMP. DEG. C(DEG. F)         43.3 (110.0)          43.3 (110.0)
  BLOWER REVOLUTIONS                          112103                61986
  CVS FLOW STD. CU. METRES(SCF)            210.3 (7427.7)        115.3 (4073.9)
  HC  SAMPLE METER/RANGE/PPM               29.0/ 2/   29         22.3/ 2/   22
  HC  BCKGRD METER/RANGE/PPM                9.7/ 2/   10          9.9/ 2/   10
  CO  SAMPLE METER/RANGE/PPM               82.2/13/   60         73.0/13/   56
  CO  BCKGRD METER/RANGE/PPM                3.8/13/    4          2.7/13/    3
  CO2 SAMPLE METER/RANGE/PCT               87.2/ 3/ 1.62         93.8/ 2/ 1.94
  CO2 BCKGRD METER/RANGE/PCT                9.3/ 3/  .07          1.5/ 2/  .05
  NOX SAMPLE METER/RANGE/PPM               53.6/ 2/   54         67.5/ 2/   68
  NOX BCKGRD METER/RANGE/PPM                1.2/ 2/    1          1.3/ 2/    1
  HC  CONCENTRATION PPM                          15                    19
  CO  CONCENTRATION PPM                          59                    51
  CO2 CONCENTRATION PCT                        1.56                  1.89
  NOX CONCENTRATION PPM                        52.5                  66.9
  HC  MASS GRAMS                               1.08                   .92
  CO  MASS GRAMS                              13.15                  6.02
  CO2 MASS GRAMS                             6019.1                4000.7
  NOX MASS GRAMS                              19.42                 13.81
      DFC, WET (DRY)                        .879 ( .870)          .855 ( .846)
      SCF, WET (DRY)                       1.000 ( .975)         1.000 ( .972)
      VOL (SCM)                               210.3                 115.3
      KM  (MEASURED)                          21.98                 16.28

  TEST NUMBER,              PVNT             153-12                153-13
  BAROMETER,                MM HG             740.9                 740.9
  HUMIDITY,                 G/KG                8.9                   8.9
  TEMPERATURE,              DEG C              22.8                  22.8
  TOTAL FUEL SULFUR,        MG/KM             20.90                 17.88

  AVG. EXH. OXYGEN,         PCT                2.81                  1.96
  CATALYST AVG. TEMP.,      DEG C               517                   583
  CATALYST MAX. TEMP.,      DEG C               618                   649
  CARBON DIOXIDE,           G/KM              280.0                 245.7
  FUEL CONSUMPTION,         L/100KM           12.00                 10.52

  HYDROCARBONS,             G/KM                .04                   .06
  CARBON MONOXIDE,          G/KM                .61                   .42
  OXIDES OF NITROGEN,       G/KM                .93                   .85
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TABLE E-56. TEST 153 EMISSIONS RESULTS

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                         PVM - 153   FTP   VEHICLE EMISSIONS RESULTS - DISABLED EGR
                                         PROJECT 11-4771-001

TEST NO.    153-21    RUN   1
VEHICLE MODEL    78 FORD MUSTANG II          VEHICLE NO.   15                          TEST WEIGHT    1588 KG(  3500 LBS)
ENGINE 4.9 L(302 CID) V-8                    DATE     8/16/78                           ACTUAL ROAD LOAD    9.2 KW( 12.3 HP)
TRANSMISSION A3                              BAG CART NO.   1                           GASOLINE  EM-344
GVW  1857 KG(  4095 LBS)                     DYNO NO.       3                           ODOMETER    6767 KM(  4205 MILES)
                                             CVS NO.        2
BAROMETER 743.20 MM HG(29.26 IN HG)
RELATIVE HUMIDITY 66 PCT                     DRY BULB TEMP. 22.8 DEG C(73.0 DEG F)
BAG RESULTS                                  ABS. HUMIDITY 11.6 GM/KG
   BAG NUMBER                                                                      NOX HUMIDITY CORRECTION FACTOR  1.03
   DESCRIPTION                                      1                   2                   3                   4
                                              COLD TRANSIENT       STABILIZED        HOT TRANSIENT        STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)               762.0 (30.0)        762.0 (30.0)        762.0 (30.0)        762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)             762.0 (30.0)        762.0 (30.0)        762.0 (30.0)        762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)            43.3 (110.0)        43.9 (111.0)        44.4 (112.0)        43.3 (110.0)
   BLOWER REVOLUTIONS                             40637               69701               40659               69623
   CVS FLOW STD. CU. METRES(SCF)               76.4 (2697.1)      130.8 (4621.2)       76.2 (2694.9)      130.8 (4620.4)
   HC  SAMPLE METER/RANGE/PPM                  12.9/ 3/  129       21.5/ 2/   21       40.8/ 2/   41       17.7/ 2/   18
   HC  BCKGRD METER/RANGE/PPM                   1.4/ 3/   14       13.6/ 2/   14       10.6/ 2/   11       10.4/ 2/   11
   CO  SAMPLE METER/RANGE/PPM                  29.7/ 3/  572       68.6/13/   53       84.0/13/   68       42.0/13/   36
   CO  BCKGRD METER/RANGE/PPM                    .5/ 3/   11        5.6/13/    5        3.0/13/    3        2.0/13/    2
   CO2 SAMPLE METER/RANGE/PCT                  84.8/ 3/ 1.56       56.4/ 3/ 1.00       75.4/ 3/ 1.38       53.6/ 3/  .94
   CO2 BCKGRD METER/RANGE/PCT                   3.8/ 3/  .06        3.5/ 3/  .05        3.4/ 3/  .06        4.4/ 3/  .07
   NOX SAMPLE METER/RANGE/PPM                  62.1/ 3/  186       28.6/ 3/   86       65.5/ 3/  196       28.9/ 3/   87
   NOX BCKGRD METER/RANGE/PPM                   1.4/ 3/    4        1.8/ 3/    5        1.1/ 3/    3        1.6/ 3/    5
   DILUTION FACTOR                                 8.25               13.20                9.61               14.22

   HC  CONCENTRATION PPM                            117                   9                  31                   8
   CO  CONCENTRATION PPM                            533                  46                  55                  33
   CO2 CONCENTRATION PCT                           1.51                 .95                1.33                 .87
   NOX CONCENTRATION PPM                          182.6                80.8               193.5                82.6
   HC  MASS GRAMS                                  5.14                 .67                1.38                 .57
   CO  MASS GRAMS                                 47.41                7.05                4.88                4.96
   CO2 MASS GRAMS                                2105.7              2201.1              1859.0              2099.0
   NOX MASS GRAMS                                 27.45               20.81               29.05               21.25

   HC  GRAMS/KM                                     .89                 .11                 .24                 .09
   CO  GRAMS/KM                                    8.23                1.14                 .85                 .80
   CO2 GRAMS/KM                                   365.4               360.7               323.6               338.6
   NOX GRAMS/KM                                    4.76                3.36                5.06                3.44
   FUEL CONSUMPTION BY CB L/100KM                 16.27               15.83               13.90               14.52

   RUN TIME                  SECONDS                505                 868                 506                 867
   AVG. EXH. OXYGEN          PERCENT               2.67                3.82                3.49                3.41
   CATALYST AVG. TEMP.       DEG. C                 393                 446                 397                 440
   CATALYST MAX. TEMP.       DEG. C                 508                 490                 525                 491
   MEASURED DISTANCE         KM                    5.76                6.19                5.79                6.18
        DFC, WET (DRY)                                   .908 ( .894)                            .917 ( .904)
        SLF, WET (DRY)                                  1.000 ( .974)                           1.000 ( .975)
        VOL (SCM)                                             207.2                                   207.1
        KM  (MEASURED)                                        11.95                                   11.97

COMPOSITE RESULTS
   TEST NUMBER            153-21
   BAROMETER     MM HG    743.2      TOTAL FUEL SULFUR    MG/KM    32.98      CARBON DIOXIDE         G/KM         3-BAG      (4-BAG)
   HUMIDITY      G/KG      11.6      AVG. EXH. OXYGEN     PCT       3.55      FUEL CONSUMPTION       L/100KM      355.7      ( 346.4)
   TEMPERATURE   DEG C     22.8      CATALYST AVG. TEMP. DEG C       418      HYDROCARBONS (THC)     G/KM         15.24      ( 15.00)
                                     CATALYST MAX. TEMP. DEG C       525      CARBON MONOXIDE        G/KM           .21      (   .30)
                                                                              OXIDES OF NITROGEN     G/KM          2.53      (  2.93)
                                                                                                                   4.12      (  4.14)
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                         PVM - 153   SET   VEHICLE EMISSIONS RESULTS - DISABLED EGR
                                         PROJECT 11-4771-001

VEHICLE MODEL    78 FORD MUSTANG II          VEHICLE NO.     15                        TEST WEIGHT    1588 KG(  3500 LBS)
ENGINE 4.9 L(302 CID) V-8                    TRANSMISSION A3                           ACTUAL ROAD LOAD    9.2 KW( 12.3 HP)
                                             GVW  1857 KG(  4095 LBS)                  GASOLINE  EM-344
   TEST NUMBER
   TEST CYCLE                                     153-22                    153-23
   RUN NUMBER                                      SET                       HFET
   DATE                                             1                         1
   ODOMETER                                      8/16/78                   8/17/78
   CVS - BAG CART - DYNAMOMETER             6796KM(  4223MILES)       6832KM(  4245MILES)                 /  /
                                                2 - 1 - 3                 2 - 1 - 3
   TEMPERATURE DEG. C (DEG. F)
   RELATIVE HUMIDITY, PCT                      23.3 / 74.0               24.4 / 76.0
   BAROMETER, MM HG(IN HG)                         50.7                      41.6
   RUN TIME, SECONDS                          743.2 (29.26)             743.2 (29.26)
                                                   1398                       766
   BLOWER DIF P MM. H2O(IN. H2O)
   BLOWER INLET P MM. H2O(IN. H2O)             762.0 (30.0)              762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)           762.0 (30.0)              762.0 (30.0)
   BLOWER REVOLUTIONS                           43.3 (110.0)              43.3 (110.0)
   CVS FLOW STD. CU. METRES(SCF)                  112331                     61590
   HC  SAMPLE METER/RANGE/PPM                211.1 (7454.7)            115.6 (4084.0)
   HC  BCKGRD METER/RANGE/PPM                 21.9/ 2/   22              20.7/ 2/   21
   CO  SAMPLE METER/RANGE/PPM                  9.4/ 2/   10               9.7/ 2/   10
   CO  BCKGRD METER/RANGE/PPM                 31.7/13/   29              24.5/13/   23
   CO2 SAMPLE METER/RANGE/PCT                  1.9/13/    2               2.3/13/    2
   CO2 BCKGRD METER/RANGE/PCT                 88.4/ 3/ 1.66              45.3/ 2/ 2.02
   NOX SAMPLE METER/RANGE/PPM                  1.7/ 3/  .03               1.7/ 2/  .06
   NOX BCKGRD METER/RANGE/PPM                 89.2/ 3/  268              36.6/ 4/  366
   HC  CONCENTRATION PPM                       1.1/ 3/    3                .6/ 4/    6
   CO  CONCENTRATION PPM                            13                        12
   CO2 CONCENTRATION PCT                            26                        19
   NOX CONCENTRATION PPM                          1.63                      1.97
   HC  MASS GRAMS                                264.7                     360.4
   CO  MASS GRAMS                                 1.61                       .83
   CO2 MASS GRAMS                                 6.27                      2.62
   NOX MASS GRAMS                               6310.0                    4169.9
        DFC, WET (DRY)                          101.96                     73.53
        SLF, WET (DRY)                       .876 ( .867)              .899 ( .893)
        VOL (SCM)                           1.000 ( .975)             1.000 ( .974)
        KM  (MEASURED)                           211.1                     115.6
                                                 21.51                     16.26
   TEST NUMBER,            PVMT
   BAROMETER,              MM HG                153-22                    153-23
   HUMIDITY,               G/KG                  743.2                     743.2
   TEMPERATURE,            DEG C                   9.3                       8.1
   TOTAL FUEL SULFUR,      MG/KM                  23.3                      24.4
                                                 26.89                     23.99
   AVG. EXH. OXYGEN,       PCT
   CATALYST AVG. TEMP.,    DEG C                  2.40                      1.39
   CATALYST MAX. TEMP.,    DEG C                   486                       569
   CARBON DIOXIDE,         G/KM                    619                       631
   FUEL CONSUMPTION,       L/100KM               293.3                     256.9
                                                 12.55                     10.96
   HYDROCARBONS,           G/KM
   CARBON MONOXIDE,        G/KM                    .07                       .05
   OXIDES OF NITROGEN,     G/KM                    .29                       .16
                                                  4.74                      4.52
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TABLE E-57. TEST 153 EMISSIONS RESULTS

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                         PVM - 153   FTP   VEHICLE EMISSIONS RESULTS - DISABLED EGR
                                           PROJECT 11-4771-001

TEST NO.   153-31   RUN   1                        VEHICLE NO.   15                TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL    78 FORD MUSTANG II                DATE     8/17/78                ACTUAL ROAD LOAD    9.2 KW( 12.3 HP)
ENGINE 4.9 L(302 CID) V-8                          BAG CART NO.  1                 GASOLINE  EM-399
TRANSMISSION A3                                    DYNO NO.      3                 ODOMETER    6849 KM(  4256 MILES)
GVW  1857 KG(  4095 LBS)                           CVS NO.       2

BAROMETER 742.44 MM HG(29.23 IN HG)                DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)
RELATIVE HUMIDITY 66 PCT                           ABS. HUMIDITY 12.1 GM/KG               NOX HUMIDITY CORRECTION FACTOR  1.05
BAG RESULTS
   BAG NUMBER                                           1                  2                  3                   4
   DESCRIPTION                                    COLD TRANSIENT      STABILIZED        HOT TRANSIENT       STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)                  749.3 (29.5)       749.3 (29.5)       749.3 (29.5)        749.3 (29.5)
   BLOWER INLET P MM. H2O(IN. H2O)                749.3 (29.5)       749.3 (29.5)       749.3 (29.5)        749.3 (29.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)               43.3 (110.0)       43.3 (110.0)       45.0 (113.0)        42.8 (109.0)
   BLOWER REVOLUTIONS                                 40729              69702              40661               69766
   CVS FLOW STD. CU. METRES(SCF)                   76.6 (2705.2)     131.1 (4629.0)      76.9 (2647.2)      131.3 (4638.1)
   HC  SAMPLE METER/RANGE/PPM                     19.5/ 3/  195      18.6/ 2/   19      44.3/ 2/   44       15.6/ 2/   16
   HC  BCKGRD METER/RANGE/PPM                      1.2/ 3/   12      11.8/ 2/   12      10.4/ 2/   10        9.2/ 2/    9
   CO  SAMPLE METER/RANGE/PPM                     28.0/ 3/  652      56.4/13/   46      45.5/13/   39       35.4/13/   31
   CO  BCKGRD METER/RANGE/PPM                       .2/ 3/    5       8.5/13/    8       2.8/13/    3        2.3/13/    2
   CO2 SAMPLE METER/RANGE/PCT                     81.0/ 3/ 1.99      55.8/ 3/  .98      74.1/ 3/ 1.35       53.4/ 3/  .93
   CO2 BCKGRD METER/RANGE/PCT                      4.0/ 3/  .06       4.2/ 3/  .06       4.4/ 3/  .07        4.1/ 3/  .06
   NOX SAMPLE METER/RANGE/PPM                     60.8/ 3/  182      85.5/ 2/   85      63.5/ 3/  190       29.2/ 3/   88
   NOX BCKGRD METER/RANGE/PPM                      1.4/ 3/    4       2.6/ 2/    3       1.1/ 3/    3        1.0/ 3/    3
   DILUTION FACTOR                                     6.55              13.59               9.88                14.29

   HC  CONCENTRATION PPM                                134                  8                 35                    7
   CO  CONCENTRATION PPM                                616                 37                 35                   28
   CO2 CONCENTRATION PCT                               1.94                .92               1.29                  .87
   NOX CONCENTRATION PPM                              178.7               83.1              187.5                 84.8
   HC  MASS GRAMS                                      5.94                .58               1.59                  .53
   CO  MASS GRAMS                                     54.91               5.65               3.09                 4.31
   CO2 MASS GRAMS                                    2019.5             2208.7             1800.2               2103.0
   NOX MASS GRAMS                                     27.41              21.81              28.68                22.30

   HC  GRAMS/KM                                        1.03                .09                .27                  .09
   CO  GRAMS/KM                                        9.55                .91                .54                  .70
   CO2 GRAMS/KM                                       350.9              357.9              312.1                343.5
   NOX GRAMS/KM                                        4.77               3.53               4.97                 3.64
   FUEL CONSUMPTION BY CB L/100KM                     15.73              15.33              13.39                14.72

   RUN TIME               SECONDS                       505                867                505                  867
   AVG. EXH. OXYGEN       PERCENT                      2.78               4.09               3.53                 4.29
   CATALYST AVG. TEMP.    DEG. C                        329                443                387                  448
   CATALYST MAX. TEMP.    DEG. C                        508                491                521                  491
   MEASURED DISTANCE      KM                           5.75               6.18               5.77                 6.12
         DFC, WET (DRY)                                     .910 ( .897)                          .919 ( .905)
         SCF, WET (DRY)                                    1.000 ( .979)                         1.000 ( .976)
         VOL (SCM)                                                207.7                                 207.7
         KM  (MEASURED)                                           11.93                                 11.89

COMPOSITE RESULTS                                                                                    3-BAG         (4-BAG)
   TEST NUMBER           153-31      TOTAL FUEL SULFUR   MG/KM    31.89     CARBON DIOXIDE       G/KM       343.5       ( 339.3)
   BAROMETER     MM HG   742.4       AVG. EXH. OXYGEN    PCT       3.76     FUEL CONSUMPTION     L/100KM    14.88       ( 14.70)
   HUMIDITY      G/KG     12.1       CATALYST AVG. TEMP. DEG C      412     HYDROCARBONS (THC)   G/KM         .34       (   .33)
   TEMPERATURE   DEG C    23.3       CATALYST MAX. TEMP. DEG C      521     CARBON MONOXIDE      G/KM        2.60       (  2.59)
                                                                            OXIDES OF NITROGEN   G/KM        4.18       (  4.22)
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                         PVM - 153   SET   VEHICLE EMISSIONS RESULTS - DISABLED EGR
                                           PROJECT 11-4771-001

                                                   VEHICLE NO.     15              TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL    78 FORD MUSTANG II                TRANSMISSION A3                 ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
ENGINE 4.9 L(302 CID) V-8                          GVW  1857 KG(  4095 LBS)        GASOLINE  EM-399

   TEST NUMBER                                     153-32                  153-33
   TEST CYCLE                                       SET                     HFET
   RUN NUMBER                                        1                       1
   DATE                                           8/17/78                 8/17/78                    /  /
   ODOMETER                                   6877KM(  4273MILES)     6914KM(  4296MILES)
   CVS - BAG CART - DYNAMOMETER                   2 - 1 - 3               2 - 1 - 3

   TEMPERATURE DEG. C (DEG. F)                   22.2 / 72.0             25.0 / 77.0
   RELATIVE HUMIDITY, PCT                            53.2                    45.7
   BAROMETER, MM HG(IN HG)                       741.4 (29.19)           741.4 (29.19)
   RUN TIME, SECONDS                                 1397                     765

   BLOWER DIF P MM. H2O(IN. H2O)                 749.3 (29.5)            749.3 (29.5)
   BLOWER INLET P MM. H2O(IN. H2O)               749.3 (29.5)            749.3 (29.5)
   BLOWER INLET TEMP. DEG. C(DEG. F)              40.6 (105.0)            43.3 (110.0)
   BLOWER REVOLUTIONS                               112220                   61953
   CVS FLOW STD. CU. METRES(SCF)                211.7 (7478.9)          115.4 (4079.9)
   HC  SAMPLE METER/RANGE/PPM                   23.6/ 2/   24           22.3/ 2/   22
   HC  BCKGRD METER/RANGE/PPM                    9.9/ 2/   10           10.8/ 2/   11
   CO  SAMPLE METER/RANGE/PPM                   39.5/13/   31           39.7/13/   31
   CO  BCKGRD METER/RANGE/PPM                    1.4/13/    1             .7/13/    1
   CO2 SAMPLE METER/RANGE/PCT                   87.4/ 3/ 1.62           44.4/ 2/ 1.97
   CO2 BCKGRD METER/RANGE/PCT                    3.5/ 3/  .05            1.5/ 2/  .05
   NOX SAMPLE METER/RANGE/PPM                   95.0/ 3/  257           32.7/ 4/  327
   NOX BCKGRD METER/RANGE/PPM                    1.1/ 3/    3             .4/ 4/    4
   HC  CONCENTRATION PPM                             15                      13
   CO  CONCENTRATION PPM                             28                      29
   CO2 CONCENTRATION PCT                            1.58                    1.93
   NOX CONCENTRATION PPM                           254.5                   323.6
   HC  MASS GRAMS                                   1.82                     .87
   CO  MASS GRAMS                                   6.92                    3.85
   CO2 MASS GRAMS                                 6119.1                  4070.2
   NOX MASS GRAMS                                  97.87                   68.11
         DFC, WET (DRY)                        .878 ( .849)            .852 ( .845)
         SCF, WET (DRY)                       1.000 ( .974)           1.000 ( .973)
         VOL (SCM)                                 211.7                   115.4
         KM  (MEASURED)                            21.72                   16.21

   TEST NUMBER,           PVMT                    153-32                  153-33
   BAROMETER,             MM HG                   741.4                   741.4
   HUMIDITY,              G/KG                      9.1                     9.2
   TEMPERATURE,           DEG C                    22.2                    25.0
   TOTAL FUEL SULFUR,     MG/KM                   25.82                   23.02

   AVG. EXH. OXYGEN,      PCT                      2.45                    1.23
   CATALYST AVG. TEMP.,   DEG C                     494                     563
   CATALYST MAX. TEMP.,   DEG C                     610                     636
   CARBON DIOXIDE,        G/KM                    281.5                   251.1
   FUEL CONSUMPTION,      L/100KM                 12.05                   10.74

   HYDROCARBONS,          G/KM                      .08                     .05
   CARBON MONOXIDE,       G/KM                      .32                     .24
   OXIDES OF NITROGEN,    G/KM                     4.51                    4.20
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TABLE E-58. TEST 154 EMISSIONS RESULTS

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                              PVM - 154    FTP   VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                                 PROJECT 11-4771-001

TEST NO.   154-11   RUN   1                         VEHICLE NO.   15
VEHICLE MODEL    78 FORD MUSTANG II                 DATE      9/ 5/78                   TEST WEIGHT    1588 KG(  3500 LBS)
ENGINE 4.9 L(302 CID) V-8                           BAG CART NO.  1                     ACTUAL ROAD LOAD    9.2 KW( 12.3 HP)
TRANSMISSION A3                                     DYNO NO.      3                     GASOLINE  EM-344
GVW  1857 KG(  4095 LBS)                            CVS NO.       2                     ODOMETER       0 KM(    -0 MILES)

BAROMETER 740.92 MM HG(29.17 IN HG)                 DRY BULB TEMP. 21.1 DEG C(70.0 DEG F)
RELATIVE HUMIDITY 68 PCT                            ABS. HUMIDITY 10.9 GM/KG
BAG RESULTS                                                                                 NOX HUMIDITY CORRECTION FACTOR  1.01
   BAG NUMBER
   DESCRIPTION                                              1                  2                    3                     4
                                                      COLD TRANSIENT       STABILIZED          HOT TRANSIENT          STABILIZED

   BLOWER DIF P MM. H2O(IN. H2O)                      762.0 (30.0)        762.0 (30.0)        762.0 (30.0)          762.0 (30.0)
   BLOWER INLET P MM. H2O(IN. H2O)                    774.7 (30.5)        762.0 (30.0)        762.0 (30.0)          762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)                   43.3 (110.0)        43.3 (110.0)        43.3 (110.0)          43.3 (110.0)
   BLOWER REVOLUTIONS                                     40979               69565               40625                 69758
   CVS FLOW STD. CU. METRES(SCF)                       76.7 (2707.4)      130.3 (4600.5)       76.1 (2687.0)        130.6 (4613.4)
   HC  SAMPLE METER/RANGE/PPM                        19.2/ 3/  192       24.6/ 2/   25       31.5/ 2/   31         22.4/ 2/   22
   HC  BCKGRD METER/RANGE/PPM                         1.7/ 3/   17       15.3/ 2/   15       14.2/ 2/   14         13.1/ 2/   13
   CO  SAMPLE METER/RANGE/PPM                        33.1/ 3/  778       51.6/12/  114       84.7/13/   63         63.0/13/   50
   CO  BCKGRD METER/RANGE/PPM                         1.0/ 3/   23        4.1/12/   17       11.3/13/   11         11.3/13/   11
   CO2 SAMPLE METER/RANGE/PCT                        83.5/ 3/ 1.59       57.0/ 3/ 1.00       66.1/ 3/ 1.14         56.5/ 3/  .94
   CO2 BCKGRD METER/RANGE/PCT                         4.4/ 3/  .07        4.2/ 3/  .06        4.6/ 3/  .07          6.0/ 3/  .08
   NOX SAMPLE METER/RANGE/PPM                        45.4/ 2/   45       24.3/ 2/   24       31.8/ 2/   32         24.7/ 2/   25
   NOX BCKGRD METER/RANGE/PPM                         1.3/ 2/    1        1.2/ 2/    1        1.2/ 2/    1          1.2/ 2/    1
   DILUTION FACTOR                                        8.22               13.18               11.28                 13.34

   HC  CONCENTRATION PPM                                  177                  10                  19                    10
   CO  CONCENTRATION PPM                                  714                  94                  50                    38
   CO2 CONCENTRATION PCT                                  1.48                 .94                1.12                   .92
   NOX CONCENTRATION PPM                                  44.3                23.2                30.7                  23.6
   HC  MASS GRAMS                                         5.62                 .79                 .81                   .77
   CO  MASS GRAMS                                        64.15               14.27                4.44                  5.85
   CO2 MASS GRAMS                                       2081.8              2251.7              1561.4                2207.0
   NOX MASS GRAMS                                         6.54                5.88                4.50                  5.94

   HC  GRAMS/KM                                            .98                 .13                 .14                   .13
   CO  GRAMS/KM                                          11.20                2.32                 .77                   .95
   CO2 GRAMS/KM                                          363.5               365.8               272.4                 359.4
   NOX GRAMS/KM                                           1.14                 .95                 .79                   .97
   FUEL CONSUMPTION BY CB L/100KM                        16.90               15.74               11.70                 15.42

   RUN TIME               SECONDS                         505                 868                 505                   867
   AVG. EXH. OXYGEN       PERCENT                         4.24                5.47                4.57                  6.11
   CATALYST AVG. TEMP.    DEG. C                           -                   -                  463                   448
   CATALYST MAX. TEMP.    DEG. C                           -                   -                  547                   550
   MEASURED DISTANCE      KM                               -                   -                  5.73                  6.14
        DFC, WET (DRY)                                    5.73                6.16
        SCF, WET (DRY)                                         .907 ( .893)                               .920 ( .906)
        VOL (SCM)                                             1.000 ( .973)                              1.000 ( .975)
        KM  (MEASURED)                                             206.9                                      206.7
                                                                   11.88                                      11.87
COMPOSITE RESULTS
   TEST NUMBER           154-11
   BAROMETER      MM HG  740.9       TOTAL FUEL SULFUR   MG/KM    31.64                                    3-BAG        (4-BAG)
   HUMIDITY       G/KG    10.9       AVG. EXH. OXYGEN    PCT       5.40     CARBON DIOXIDE       G/KM      334.7       ( 337.7)
   TEMPERATURE    DEG C   21.1       CATALYST AVG. TEMP. DEG C      --      FUEL CONSUMPTION     L/100KM   14.74       ( 14.80)
                                     CATALYST MAX. TEMP. DEG C     547      HYDROCARBONS (THC)   G/KM        .31       (   .31)
                                                                            CARBON MONOXIDE      G/KM       3.73       (  3.33)
                                                                            OXIDES OF NITROGEN   G/KM        .94       (   .95)
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                              PVM - 154    SET   VEHICLE EMISSIONS RESULTS - UNMODIFIED
                                                 PROJECT 11-4771-001

VEHICLE MODEL    78 FORD MUSTANG II                 VEHICLE NO.     15                     TEST WEIGHT    1588 KG(  3500 LBS)
ENGINE 4.9 L(302 CID) V-8                           TRANSMISSION A3                        ACTUAL ROAD LOAD    9.2 KW( 12.3 HP)
                                                    GVW  1857 KG(  4095 LBS)               GASOLINE  EM-344
   TEST NUMBER
   TEST CYCLE                                         154-12                  154-13
   RUN NUMBER                                          SET                     HFET
   DATE                                                 1                       1
   ODOMETER                                          9/ 5/78                 9/ 5/78
   CVS - BAG CART - DYNAMOMETER                  8531KM(  5301MILES)     8600KM(  5344MILES)              / /
                                                   2 - 1 - 3               2 - 1 - 3
   TEMPERATURE DEG. C (DEG. F)
   RELATIVE HUMIDITY, PCT                          23.3 / 74.0             23.3 / 74.0
   BAROMETER, MM HG(IN HG)                            47.1                    47.1
   RUN TIME, SECONDS                             740.9 (29.17)           740.7 (29.16)
                                                      1397                    765
   BLOWER DIF P MM. H2O(IN. H2O)
   BLOWER INLET P MM. H2O(IN. H2O)               774.7 (30.5)            762.0 (30.0)
   BLOWER INLET TEMP. DEG. C(DEG. F)             774.7 (30.5)            762.0 (30.0)
   BLOWER REVOLUTIONS                             43.3 (110.0)            43.3 (110.0)
   CVS FLOW STD. CU. METRES(SCF)                    112915                  62034
   HC  SAMPLE METER/RANGE/PPM                    210.1 (7421.4)          115.3 (4070.7)
   HC  BCKGRD METER/RANGE/PPM                    31.7/ 2/   32           25.2/ 2/   25
   CO  SAMPLE METER/RANGE/PPM                    16.1/ 2/   16           12.2/ 2/   12
   CO  BCKGRD METER/RANGE/PPM                    43.0/13/   64           51.6/13/   43
   CO2 SAMPLE METER/RANGE/PCT                     5.4/13/    6            4.6/13/    4
   CO2 BCKGRD METER/RANGE/PCT                    87.8/ 3/ 1.63           46.2/ 2/ 2.07
   NOX SAMPLE METER/RANGE/PPM                     4.1/ 3/  .06            1.7/ 2/  .06
   NOX BCKGRD METER/RANGE/PPM                    59.4/ 2/   59           76.3/ 2/   76
   HC  CONCENTRATION PPM                          1.2/ 2/    1            1.9/ 2/    2
   CO  CONCENTRATION PPM                              18                      15
   CO2 CONCENTRATION PCT                              56                      37
   NOX CONCENTRATION PPM                             1.58                    2.02
   HC  MASS GRAMS                                    53.3                    74.7
   CO  MASS GRAMS                                    2.13                     .94
   CO2 MASS GRAMS                                   13.62                    4.98
   NOX MASS GRAMS                                  6068.4                  4260.5
        DFC, WET (DRY)                              20.06                   15.41
        SCF, WET (DRY)                           .878 ( .870)            .895 ( .838)
        VOL (SCM)                               1.000 ( .976)           1.000 ( .972)
        KM  (MEASURED)                              210.1                   115.3
                                                    21.46                   16.41
   TEST NUMBER,            PVMT
   BAROMETER,              MM HG                   154-12                  154-13
   HUMIDITY,               G/KG                     740.9                   740.7
   TEMPERATURE,            DEG C                      8.6                     8.6
   TOTAL FUEL SULFUR,      MG/KM                     23.3                    23.3
                                                    25.44                   23.80
   AVG. EXH. OXYGEN,       PCT
   CATALYST AVG. TEMP.,    DEG C                     4.03                    8.17
   CATALYST MAX. TEMP.,    DEG C                      563                     620
   CARBON DIOXIDE,         G/KM                       652                     661
   FUEL CONSUMPTION,       L/100KM                  282.8                   259.6
                                                    12.13                   11.11
   HYDROCARBONS,           G/KM
   CARBON MONOXIDE,        G/KM                       .10                     .06
   OXIDES OF NITROGEN,     G/KM                       .63                     .30
                                                      .93                     .94
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TABLE E-59. TEST 154 EMISSIONS RESULTS

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                       PVH - 154   FTP   VEHICLE EMISSIONS RESULTS - HIGH OIL CONSUMPTION
                                          PROJECT 11-4771-001

TEST NO.   154-21   RUN   1                    VEHICLE NO.   15                   TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 FORD MUSTANG II             DATE     9/20/78                   ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
ENGINE 4.9 L(302 CID) V-8                      BAG CART NO.  1                    GASOLINE  EM-344
TRANSMISSION A3                                DYNO NO.      3                    ODOMETER   8723 KM(  5420 MILES)
GVW  1857 KG(  4095 LBS)                       CVS NO.       2

BAROMETER 740.66 MM HG(29.16 IN HG)            DRY BULB TEMP. 22.8 DEG C(73.0 DEG F)
RELATIVE HUMIDITY 61 PCT                       ABS. HUMIDITY 10.9 GM/KG           NOX HUMIDITY CORRECTION FACTOR  1.01
BAG RESULTS
  BAG NUMBER                                         1                 2                 3                 4
  DESCRIPTION                                 COLD TRANSIENT      STABILIZED       HOT TRANSIENT      STABILIZED

  BLOWER DIF P MM. H2O(IN. H2O)                762.0 (30.0)      762.0 (30.0)      762.0 (30.0)      762.0 (30.0)
  BLOWER INLET P MM. H2O(IN. H2O)              762.0 (30.0)      762.0 (30.0)      762.0 (30.0)      762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)            39.4 (103.0)      43.3 (110.0)      43.3 (110.0)      43.3 (110.0)
  BLOWER REVOLUTIONS                              40572             69651             40683             69658
  CVS FLOW STD. CU. METRES(SCF)               76.5 (2701.7)    130.4 (4605.1)     76.2 (2690.0)    130.2 (4598.4)
  HC  SAMPLE METER/RANGE/PPM                  21.5/ 3/  215     30.4/ 2/   31     61.3/ 2/   61     20.8/ 2/   21
  HC  BCKGRD METER/RANGE/PPM                   1.6/ 3/   16     13.8/ 2/   14     11.7/ 2/   12     10.5/ 2/   10
  CO  SAMPLE METER/RANGE/PPM                  51.0/ 3/ 1251     64.7/12/  145     64.6/11/  266     73.8/13/   56
  CO  BCKGRD METER/RANGE/PPM                    .8/ 3/   18      5.7/12/   10      2.6/11/    8      5.1/13/    5
  CO2 SAMPLE METER/RANGE/PCT                  84.1/ 3/ 1.55     56.0/ 3/  .98     75.8/ 3/ 1.38     55.4/ 3/  .98
  CO2 BCKGRD METER/RANGE/PCT                   4.0/ 3/  .06      3.4/ 3/  .06      4.3/ 3/  .07      4.1/ 3/  .06
  NOX SAMPLE METER/RANGE/PPM                  38.2/ 2/   38     18.4/ 2/   19     37.2/ 2/   37     24.0/ 2/   24
  NOX BCKGRD METER/RANGE/PPM                    .9/ 2/    1       .7/ 2/    1       .7/ 2/    1       .7/ 2/    1
  DILUTION FACTOR                                 7.90             13.39              9.47             13.69

  HC  CONCENTRATION PPM                           201                18                51                11
  CO  CONCENTRATION PPM                          1173               130               247                49
  CO2 CONCENTRATION PCT                          1.50               .93              1.32               .92
  NOX CONCENTRATION PPM                          37.4              18.3              36.6              23.4
  HC  MASS GRAMS                                 8.87              1.36              2.23               .83
  CO  MASS GRAMS                               109.50             19.79             21.88              7.48
  CO2 MASS GRAMS                               2103.0            2217.1            1846.5            2202.5
  NOX MASS GRAMS                                 5.51              4.68              5.36              5.85

  HC  GRAMS/KM                                   1.53               .22               .39               .14
  CO  GRAMS/KM                                  18.88              3.22              3.80              1.22
  CO2 GRAMS/KM                                  362.6             361.1             320.8             360.7
  NOX GRAMS/KM                                    .95               .75               .93               .96
  FUEL CONSUMPTION BY CB L/100KM                16.89             15.66             14.00             15.50

  RUN TIME               SECONDS                  505               866               505               865
  AVG. EXH. OXYGEN       PERCENT                 2.85              3.77              3.16              3.81
  CATALYST AVG. TEMP.    DEG. C                   344               447               455               443
  CATALYST MAX. TEMP.    DEG. C                   612               584               601               559
  MEASURED DISTANCE      KM                      5.80              6.14              5.76              6.11
       DFC, WET (DRY)                                  .906 ( .894)                         .914 ( .902)
       SCF, WET (DRY)                                 1.000 ( .976)                        1.000 ( .976)
       VOL (SCM)                                            206.9                                206.4
       KM  (MEASURED)                                       11.94                                11.86

COMPOSITE RESULTS                                                                                          3-BAG       (4-BAG)
  TEST NUMBER            154-21      TOTAL FUEL SULFUR   MG/KM   33.13      CARBON DIOXIDE       G/KM      350.3      ( 350.1)
  BAROMETER       MM HG  740.7       AVG. EXH. OXYGEN    PCT      3.50      FUEL CONSUMPTION     L/100KM   15.96      ( 15.91)
  HUMIDITY        G/KG    10.9       CATALYST AVG. TEMP. DEG C     472      HYDROCARBONS (THC)   G/KM        .59      (   .52)
  TEMPERATURE     DEG C   22.8       CATALYST MAX. TEMP. DEG C     612      CARBON MONOXIDE      G/KM       6.47      (  5.89)
                                                                            OXIDES OF NITROGEN   G/KM        .89      (   .90)


                       PVH - 154   SET   VEHICLE EMISSIONS RESULTS - HIGH OIL CONSUMPTION
                                          PROJECT 11-4771-001

                                               VEHICLE NO.      15                TEST WEIGHT   1588 KG(  3500 LBS)
VEHICLE MODEL   78 FORD MUSTANG II             TRANSMISSION A3                    ACTUAL ROAD LOAD   9.2 KW( 12.3 HP)
ENGINE 4.9 L(302 CID) V-8                      GVW  1857 KG(  4095 LBS)           GASOLINE  EM-344

  TEST NUMBER                                     154-22                 154-23
  TEST CYCLE                                        SET                   HFET
  RUN NUMBER                                         1                     1
  DATE                                            9/20/78               9/20/78                         /  /
  ODOMETER                                   8752KM(  5438MILES)   8787KM(  5460MILES)
  CVS - BAG CART - DYNAMOMETER                   2 - 1 - 3             2 - 1 - 3

  TEMPERATURE DEG. C (DEG. F)                   23.3 / 74.0           25.0 / 77.0
  RELATIVE HUMIDITY, PCT                           59.4                  49.1
  BARMOETER, MM HG(IN HG)                      741.2 (29.18)         741.2 (29.18)
  RUN TIME, SECONDS                                1398                   766

  BLOWER DIF P MM. H2O(IN. H2O)                762.0 (30.0)          762.0 (30.0)
  BLOWER INLET P MM. H2O(IN. H2O)              762.0 (30.0)          762.0 (30.0)
  BLOWER INLET TEMP. DEG. C(DEG. F)            43.3 (110.0)          43.9 (111.0)
  BLOWER REVOLUTIONS                              112529                61787
  CVS FLOW STD. CU. METRES(SCF)               210.8 (7445.7)        115.7 (4085.8)
  HC  SAMPLE METER/RANGE/PPM                  47.1/ 2/   47         34.1/ 2/   34
  HC  BCKGRD METER/RANGE/PPM                  15.5/ 2/   15         13.2/ 2/   13
  CO  SAMPLE METER/RANGE/PPM                  96.2/12/  239         68.1/12/  154
  CO  BCKGRD METER/RANGE/PPM                   1.5/12/    3          1.3/12/    2
  CO2 SAMPLE METER/RANGE/PCT                  89.0/ 3/ 1.66         95.5/ 2/ 2.03
  CO2 BCKGRD METER/RANGE/PCT                   3.7/ 3/  .06          1.7/ 2/  .06
  NOX SAMPLE METER/RANGE/PPM                  47.4/ 2/   48         48.4/ 2/   49
  NOX BCKGRD METER/RANGE/PPM                   1.2/ 2/    1          1.3/ 2/    1
  HC  CONCENTRATION PPM                            34                    23
  CO  CONCENTRATION PPM                           225                   193
  CO2 CONCENTRATION PCT                          1.61                  1.98
  NOX CONCENTRATION PPM                          46.9                  47.8
  HC  MASS GRAMS                                 4.08                  1.53
  CO  MASS GRAMS                                55.26                 19.29
  CO2 MASS GRAMS                               6206.5                4199.0
  NOX MASS GRAMS                                18.44                 10.31
       DFC, WET (DRY)                          .874 ( .865)          .847 ( .839)
       SCF, WET (DRY)                         1.000 ( .974)         1.000 ( .972)
       VOL (SCM)                                210.8                 115.7
       KM  (MEASURED)                           21.83                 16.55

  TEST NUMBER,           PVHT                   154-22                154-23
  BAROMETER,             MM HG                   741.2                 741.2
  HUMIDITY,              G/KG                     10.8                   9.9
  TEMPERATURE,           DEG C                    23.3                  25.0
  TOTAL FUEL SULFUR,     MG/KM                   26.43                 23.37

  AVG. EXH. OXYGEN,      PCT                      2.45                   .95
  CATALYST AVG. TEMP.,   DEG C                     558                   614
  CATALYST MAX. TEMP.,   DEG C                     674                   695
  CARBON DIOXIDE,        G/KM                    284.3                 253.9
  FUEL CONSUMPTION,      L/100KM                 12.33                 10.91

  HYDROCARBONS,          G/KM                      .19                   .09
  CARBON MONOXIDE,       G/KM                     2.53                  1.17
  OXIDES OF NITROGEN,    G/KM                      .84                   .62
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TABLE E-60. TEST 154 EMISSIONS RESULTS

PVM - 154 FTP VEHICLE EMISSIONS RESULTS - HIGH OIL CONSUMPTION
PROJECT 11-4771-001

TEST NO. 154-31 RUN 1	VEHICLE NO. 15	TEST WEIGHT 1588 KG(3500 LBS)
VEHICLE MODEL 78 FORD MUSTANG II	DATE 9/21/78	ACTUAL ROAD LOAD 9.2 KW(12.3 HP)
ENGINE 4.9 L(302 CID) V-8	BAG CART NO. 1	GASOLINE EM-344
TRANSMISSION A3	DYNO NO. 3	ODOMETER 8886 KM(5972 MILES)
GVW 1857 KG(4095 LBS)	CVS NO. 2	

BAROMETER 742.44 MM HG(29.23 IN HG)
RELATIVE HUMIDITY 58 PCT
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)
ABS. HUMIDITY 10.6 GM/KG
NOX HUMIDITY CORRECTION FACTOR 1.02

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	COLD TRANSIENT	STABILIZED	HOT TRANSIENT	STABILIZED
BLOWER DIF P MM. H2O(IN. H2O)	762.0 (30.0)	762.0 (30.0)	762.0 (30.0)	762.0 (30.0)
BLOWER INLET P MM. H2O(IN. H2O)	762.0 (30.0)	762.0 (30.0)	762.0 (30.0)	762.0 (30.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	43.9 (111.0)	43.3 (110.0)	43.3 (110.0)	43.3 (110.0)
BLOWER REVOLUTIONS	40709	69666	40768	69608
CVS FLOW STD. CU. METRES(SCF)	76.3 (2696.0)	130.8 (4618.9)	76.5 (2702.0)	130.6 (4614.5)
HC SAMPLE METER/RANGE/PPM	17.3/ 3/ 173	26.3/ 2/ 26	55.5/ 2/ 55	20.7/ 2/ 21
HC BCKGRD METER/RANGE/PPM	1.9/ 3/ 19	15.3/ 2/ 15	12.1/ 2/ 12	12.2/ 2/ 12
CO SAMPLE METER/RANGE/PPM	34.5/ 3/ 941	46.2/12/ 101	95.6/12/ 237	50.8/13/ 43
CO BCKGRD METER/RANGE/PPM	.5/ 3/ 11	4.8/12/ 9	2.7/12/ 5	4.6/13/ 4
CO2 SAMPLE METER/RANGE/PCT	83.0/ 3/ 1.53	56.5/ 3/ .99	74.5/ 3/ 1.36	55.5/ 3/ .97
CO2 BCKGRD METER/RANGE/PCT	4.3/ 3/ .07	3.9/ 3/ .06	3.9/ 3/ .06	4.2/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	41.2/ 2/ 41	21.3/ 2/ 21	37.0/ 2/ 37	26.0/ 2/ 26
NOX BCKGRD METER/RANGE/PPM	.8/ 2/ 1	.7/ 2/ 1	.7/ 2/ 1	.7/ 2/ 1
DILUTION FACTOR	8.18	13.32	9.68	13.67
HC CONCENTRATION PPM	156	12	45	9
CO CONCENTRATION PPM	886	90	222	37
CO2 CONCENTRATION PCT	1.47	.94	1.30	.91
NOX CONCENTRATION PPM	40.5	20.7	36.4	25.4
HC MASS GRAMS	6.88	.92	1.97	.71
CO MASS GRAMS	78.78	13.65	19.78	5.63
CO2 MASS GRAMS	2060.5	2247.1	1825.4	2187.6
NOX MASS GRAMS	5.90	5.15	5.31	6.32
HC GRAMS/KM	1.20	.15	.34	.12
CO GRAMS/KM	13.69	2.22	3.45	.92
CO2 GRAMS/KM	357.9	365.8	318.2	357.4
NOX GRAMS/KM	1.02	.84	.93	1.03
FUEL CONSUMPTION BY CB L/100KM	16.36	15.78	13.86	15.33
RUN TIME SECONDS	505	866	506	865
AVG. EXH. OXYGEN PERCENT	2.91	3.95	3.34	4.34
CATALYST AVG. TEMP. DEG. C	397	447	464	470
CATALYST MAX. TEMP. DEG. C	588	533	587	530
MEASURED DISTANCE KM	5.76	6.14	5.74	6.12

	BAGS 1 + 2	BAGS 3 + 4
DFC, WET (DRY)	.908 (.896)	.916 (.904)
SCF, WET (DRY)	1.000 (.977)	1.000 (.977)
VOL (SCM)	207.1	207.2
KM (MEASURED)	11.90	11.86

COMPOSITE RESULTS

TEST NUMBER		154-31
BAROMETER	MM HG	742.4
HUMIDITY	G/KG	10.6
TEMPERATURE	DEG C	23.3

TOTAL FUEL SULFUR	MG/KM	32.44
AVG. EXH. OXYGEN	PCT	3.66
CATALYST AVG. TEMP.	DEG C	474
CATALYST MAX. TEMP.	DEG C	588

		3-BAG	(4-BAG)
CARBON DIOXIDE	G/KM	351.1	(348.6)
FUEL CONSUMPTION	L/100KM	15.37	(15.29)
HYDROCARBONS (THC)	G/KM	.42	(.41)
CARBON MONOXIDE	G/KM	4.94	(4.56)
OXIDES OF NITROGEN	G/KM	.90	(.96)

PVM - 154 SBT VEHICLE EMISSIONS RESULTS - HIGH OIL CONSUMPTION
PROJECT 11-4771-001

VEHICLE MODEL 78 FORD MUSTANG II	VEHICLE NO. 15	TEST WEIGHT 1588 KG(3500 LBS)
ENGINE 4.9 L(302 CID) V-8	TRANSMISSION A3	ACTUAL ROAD LOAD 9.2 KW(12.3 HP)
	GVW 1857 KG(4095 LBS)	GASOLINE EM-344

TEST NUMBER	154-32	154-33	
TEST CYCLE	SET	HFET	
RUN NUMBER	1	1	
DATE	9/21/78	9/21/78	/ /
ODOMETER	8834KM(5489MILES)	8871KM(5512MILES)	
CVS - BAG CART - DYNAMOMETER	2 - 1 - 3	2 - 1 - 3	
TEMPERATURE DEG. C (DEG. F)	23.3 / 74.0	27.2 / 81.0	
RELATIVE HUMIDITY, PCT	58.1	45.0	
BAROMETER, MM HG(IN HG)	742.4 (29.23)	742.4 (29.23)	
RUN TIME, SECONDS	1397	767	
BLOWER DIF P MM. H2O(IN. H2O)	762.0 (30.0)	762.0 (30.0)	
BLOWER INLET P MM. H2O(IN. H2O)	762.0 (30.0)	762.0 (30.0)	
BLOWER INLET TEMP. DEG. C(DEG. F)	43.9 (111.0)	44.4 (112.0)	
BLOWER REVOLUTIONS	112415	61893	
CVS FLOW STD. CU. METRES(SCF)	210.8 (7445.1)	115.9 (4092.9)	
HC SAMPLE METER/RANGE/PPM	48.5/ 2/ 48	36.8/ 2/ 37	
HC BCKGRD METER/RANGE/PPM	17.6/ 2/ 18	16.2/ 2/ 16	
CO SAMPLE METER/RANGE/PPM	92.4/12/ 226	51.7/12/ 119	
CO BCKGRD METER/RANGE/PPM	3.0/12/ 5	1.8/12/ 3	
CO2 SAMPLE METER/RANGE/PCT	89.9/ 3/ 1.67	95.2/ 2/ 2.02	
CO2 BCKGRD METER/RANGE/PCT	3.9/ 3/ .06	1.8/ 2/ .07	
NOX SAMPLE METER/RANGE/PPM	55.7/ 2/ 56	66.5/ 2/ 66	
NOX BCKGRD METER/RANGE/PPM	2.0/ 2/ 2	1.8/ 2/ 2	
HC CONCENTRATION PPM	33	23	
CO CONCENTRATION PPM	210	106	
CO2 CONCENTRATION PCT	1.61	1.96	
NOX CONCENTRATION PPM	54.0	65.0	
HC MASS GRAMS	4.03	1.59	
CO MASS GRAMS	51.62	14.29	
CO2 MASS GRAMS	6220.1	4160.4	
NOX MASS GRAMS	21.70	14.24	
DFC, WET (DRY)	.879 (.863)	.848 (.842)	
SCF, WET (DRY)	1.000 (.972)	1.000 (.973)	
VOL (SCM)	210.8	115.9	
KM (MEASURED)	21.80	16.37	

TEST NUMBER,	PVMT	154-32	154-33
BAROMETER,	MM HG	742.4	742.4
HUMIDITY,	G/KG	10.6	10.4
TEMPERATURE,	DEG C	23.3	27.2
TOTAL FUEL SULFUR,	MG/KM	26.52	23.40
AVG. EXH. OXYGEN,	PCT	2.54	1.25
CATALYST AVG. TEMP.,	DEG C	561	618
CATALYST MAX. TEMP.,	DEG C	652	666
CARBON DIOXIDE,	G/KM	285.7	254.1
FUEL CONSUMPTION,	L/100KM	12.38	10.92
HYDROCARBONS,	G/KM	.18	.09
CARBON MONOXIDE,	G/KM	2.37	.87
OXIDES OF NITROGEN,	G/KM	1.00	.87

APPENDIX F

AVERAGE VALUES FOR THE UNMODIFIED CONFIGURATION

	Car	Description
TABLE F-1	11	1977 AMC Pacer
TABLE F-2	12	1978 Chevrolet Malibu
TABLE F-3	13	1978 Chev. Malibu (Calif.)
TABLE F-4	14	1978 Ford Granada
TABLE F-5	15	1978 Ford Mustang II

Notes: 1. A double dash (--) means no valid data were available.

2. Measured values were 0.00 mg/km for all spaces left blank for Other Elements

TABLE F-1. AVERAGE, MINIMUM AND MAXIMUM VALUES FOR THE UNMODIFIED CONFIGURATION
1977 AMC PACER - 49 STATE W/O CATALYST

	EMISSION RATE, MG/KM (Except as Noted)								
	FTP			SET			HFET		
	AVG	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX
Test Number, PVM-ST	11X-11			11X-12			11X-13		
Barometer, mm Hg	743.6	741.9	746.3	741.4	737.9	742.7	741.4	737.9	742.7
Humidity, g/kg	10.2	9.4	12.4	9.5	9.2	9.8	10.0	9.0	10.7
Temperature, °C	24.3	22.2	26.1	25.0	23.3	26.7	25.3	23.9	28.3
Total Fuel Sulfur, mg/km	30.7	27.95	31.94	24.66	23.99	25.33	22.26	21.30	23.38
Avg. Exh. Oxygen, %	6.00	5.42	6.55	5.30	4.88	5.70	4.81	4.66	4.90
Catalyst Avg. Temp., °C	--	--	--	--	--	--	--	--	--
Catalyst Max. Temp., °C	--	--	--	--	--	--	--	--	--
Carbon Dioxide, g/km	318.9	304.9	326.1	265.5	261.0	269.6	241.5	228.9	251.1
Fuel Cons., ℓ/100 km	14.46	13.60	14.91	11.63	11.41	11.82	10.49	9.94	10.91
Regulated Emissions									
Hydrocarbons, (THC), g/km	0.73	0.59	0.83	0.37	0.28	0.46	0.31	0.25	0.34
Carbon Monoxide, g/km	11.14	7.56	14.03	3.65	1.91	5.28	2.11	1.68	2.73
Oxides of Nitrogen, g/km	1.21	1.11	1.38	1.24	1.15	1.30	1.40	1.36	1.52
Particulates									
Total Particulates	31.33	24.59	36.33	14.81	10.96	20.65	12.88	8.03	14.60
Sulfate	0.68	0.15	1.33	0.32	0.24	0.39	0.24	0.14	0.31
Sulfate as % of TFS, %	0.74	0.16	1.43	0.43	0.32	0.54	0.36	0.22	0.45
Compound Group Totals									
Aldehydes & Ketones	13.38	7.5	19.1	14.0	8.1	27.6	16.6	11.0	22.6
Individual Hydrocarbons	316.	259.	369.	137.8	126.5	146.	161.1	185.	141.2
Organic Sulfides	0.20	0.10	0.39	0.07	0.01	0.12	0.07	0.00	0.19
Organic Amines	0.03	0.00	0.06	0.02	0.00	0.03	0.01	0.00	0.03
Other Compounds									
Ammonia	3.05	1.02	4.56	1.13*	1.13	1.13	1.28*	1.28	1.28
Cyanide & Cyanogen	2.35	1.77	3.31	0.79	0.16	1.23	1.60	0.15	2.89
DMNA	0.00	0.00	0.00	--	--	--	--	--	--
Hydrogen Sulfide	0.04	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00
Nickel Carbonyl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrous Oxide	3.	2.92	3.	3.	2.	4.	4.	3.88	4.

TABLE F-1 (Cont'd). AVERAGE, MINIMUM AND MAXIMUM VALUES FOR THE UNMODIFIED CONFIGURATION
1977 AMC PACER - 49 STATE W/O CATALYST

	EMISSION RATE, MG/KM (Except as Noted)								
	FTP			SET			HFET		
	AVG	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX
Test Number, PVM-ST	11X-11			11X-12			11X-13		
Aldehydes and Ketones									
Formaldehyde	9.71	5.96	13.73	10.66	6.53	20.50	10.86	7.05	12.66
Acetaldehyde	2.35	0.68	3.95	2.53	0.95	5.43	3.80	2.11	6.07
Acetone	0.77	0.00	2.14	0.33	0.00	1.08	0.96	0.00	2.21
Isobutyraldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone	0.35	0.15	0.65	0.33	0.10	0.53	0.68	0.31	1.45
Crotonaldehyde	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.19	0.07	0.31	0.14	0.04	0.19	0.25	0.10	0.47
Benzaldehyde	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	13.4	7.5	19.1	14.0	8.1	27.6	16.6	11.0	22.6
Total as % of THC, %	1.9	1.0	2.9	3.6	2.3	6.0	5.3	4.4	7.1
Individual Hydrocarbons									
Methane	48.	31.	76.	13.	9.53	15.	21.	8.74	39.
Ethylene	83.	71.	107.	46.	44.	48.	51.	48.	52.
Ethane	7.	6.20	9.	3.	2.48	4.	3.	2.33	3.
Acetylene	35.	29.	45.	15.	13.8	16.	16.	14.52	17.
Propane	5.	0.	13.	1.	0.00	3.	3.	0.00	8.
Propylene	38.	31.	47.	20.	19.	21.	22.	22.	23.
Benzene	40.	32.	46.	18.	16.58	18.	20.	17.58	21.
Toluene	60.	45.	85.	22.	22.	27.	27.	23.88	29.
Total Individual HC	316.	259.	369.	138.	126.5	146.	161.	141.2	184.
Total as % of THC, %	44.	31.	51.	39.	31.7	45.2	53.	49.1	56.5
Organic Sulfides									
Carbonyl Sulfide	0.11	0.05	0.18	0.01	0.00	0.04	0.02	0.00	0.06
Methyl Sulfide	0.05	0.01	0.07	0.04	0.01	0.08	0.05	0.00	0.18
Ethyl Sulfide	0.02	0.00	0.07	0.02	0.00	0.04	0.01	0.00	0.01
Methyl Disulfide	0.02	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00
Organic Amines									
Monomethylamine	0.01	0.00	0.03	0.01	0.00	0.01	0.01	0.00	0.03
Monoethylamine	0.02	0.00	0.04	0.01	0.00	0.03	0.00	0.00	0.00
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE F-1 (Cont'd). AVERAGE, MINIMUM AND MAXIMUM VALUES FOR THE UNMODIFIED CONFIGURATION
1977 AMC PACER - 49 STATE W/O CATALYST

		EMISSION RATE, MG/KM (Except at Noted)								
		FTP			SET			HFET		
		AVG	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX
Test Number, PVM-ST		11X-11			11X-12			11X-13		
Other Elements										
Chromium	Cr							0		
Lead	Pb				0.07	0.00	0.27	0.18	0.00	0.70
Manganese	Mn							0		
Arsenic	As							0		
Mercury	Hg							0		
Bromine	Br							0.12	0.00	0.46
Phosphorus	P	0.01	0.01	0.02	0.01	0.00	0.02	0		
Silicon	Si				0.00	0.00	0.01	0		
Cadmium	Cd							0		
Aluminum	Al							0		
Sulfur	S	0.05	0.02	0.09	0.07	0.04	0.13	0.06	0.03	0.11
Sodium	Na									
Fluorine	F									
Magnesium	Mg	0.00	0.00	0.01						
Potassium	K									
Chlorine	Cl	0.01	0.00	0.02	0.00	0.00	0.01	0.01	0.00	0.02
Platinum	Pt									
Zinc	Zn	0.01	0.00	0.02						
Copper	Cu									
Nickel	Ni									
Iron	Fe	0.15	0.03	0.35	0.04	0.02	0.07	0.02	0.00	0.05
Vanadium	V									
Titanium	Ti									
Barium	Ba	0.01	0.00	0.03	0.01	0.01	0.02	0.01	0.00	0.01
Calcium	Ca	0.01	0.00	0.02	0.01	0.00	0.02			

*Validity of the average value given is questionable due to insufficient data points or extreme variation of the data points.

TABLE F-2. AVERAGE, MINIMUM AND MAXIMUM VALUES FOR THE UNMODIFIED CONFIGURATION
1978 CHEVROLET MALIBU - 49 STATE

	EMISSION RATE, MG/KM (Except as Noted)								
	FTP			SET			HFET		
	AVG	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX
Test Number, PVM-ST	12X-11			12X-12			12X-13		
Barometer, mm Hg	742.4	741.2	743.7	743.0	741.9	743.2	742.6	741.9	743.2
Humidity, g/kg	12.2	11.4	14.2	9.8	8.8	11.3	9.6	8.8	10.6
Temperature, °C	23.8	21.7	27.2	24.1	22.8	26.7	24.6	23.3	26.7
Total Fuel Sulfur, mg/km	29.11	28.05	30.00	22.60	21.86	23.37	20.14	19.03	20.94
Avg. Exh. Oxygen, %	2.07	1.83	2.50	1.84	1.71	2.05	1.36	1.14	1.50
Catalyst Avg. Temp., °C	384.	378.	392.	492.	486.	499.	547.	515.	559.
Catalyst Max. Temp., °C	477.	469.	491.	586.	576.	606.	600.	584.	617.
Carbon Dioxide, g/km	312.0	299.1	317.8	247.9	237.8	253.2	221.5	215.9	227.3
Fuel Cons., ℓ/100 km	13.73	13.09	14.0	10.7	10.20	10.90	9.49	9.26	9.77
Regulated Emissions									
Hydrocarbons, (THC), g/km	0.31	0.26	0.39	0.05	0.04	0.06	0.03	0.02	0.04
Carbon Monoxide, g/km	5.54	4.24	7.38	1.02	0.65	1.37	0.49	0.18	0.96
Oxides of Nitrogen, g/km	0.75	0.69	0.84	0.92	0.87	0.96	1.02	0.95	1.12
Particulates									
Total Particulates	5.85	3.61	9.59	1.37	0.84	2.32	1.12	0.53	1.75
Sulfate	0.95*	0.19	1.91	0.11	0.06	0.17	0.11	0.06	0.21
Sulfate as % of TFS, %	1.10*	0.22	2.27	0.16	0.09	0.26	0.18	0.11	0.35
Compound Group Totals									
Aldehydes & Ketones	1.7	0.7	2.6	1.6	1.0	3.4	0.9	0.7	1.0
Individual Hydrocarbons	146.9*	146.9	146.9	42.1*	42.1	42.1	29.9*	29.9	29.9
Organic Sulfides	0.47	0.11	0.85	0.19	0.00	0.61	0.04	0.01	0.14
Organic Amines	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Other Compounds									
Ammonia	3.06	1.98	4.65	2.21*	2.21	2.21	4.95*	4.95	4.95
Cyanide & Cyanogen	0.60	0.37	0.84	0.15	0.09	0.24	0.16	0.05	0.34
DMNA	0.08	0.00	0.15	--	--	--	--	--	--
Hydrogen Sulfide	0.00	0.00	0.00	0.01	0.00	0.03	0.01	0.00	0.03
Nickel Carbonyl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrous Oxide	41.	40.24	42.	29.	21.	36.71	16.51*	16.51	16.51

TABLE F-2 (Cont'd). AVERAGE, MINIMUM AND MAXIMUM VALUES FOR THE UNMODIFIED CONFIGURATION
1978 CHEVROLET MALIBU - 49 STATE

	EMISSION RATE, MG/KM (Except as Noted)								
	FTP			SET			HFET		
	AVG	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX
Test Number, PVM-ST	12X-11			12X-12			12X-13		
Aldehydes and Ketones									
Formaldehyde	1.10	0.53	1.60	0.94	0.86	1.01	0.93	0.49	1.85
Acetaldehyde	0.31	0.00	0.79	0.15	0.00	0.61	0.18	0.00	0.57
Acetone	0.05	0.00	0.18	0.40	0.00	1.59	0.00	0.00	0.00
Isobutyraldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone	0.06	0.00	0.25	0.06	0.00	0.22	0.26	0.00	0.80
Crotonaldehyde	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.11	0.00	0.18	0.10	0.03	0.17	0.20	0.00	0.55
Benzaldehyde	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	1.7	0.7	2.6	1.6	1.0	3.4	0.9	0.7	1.0
Total as % of THC, %	0.5	0.2	1.0	3.3	0.1	9.3	3.8	3.0	5.0
Individual Hydrocarbons									
Methane	43.43*	43.43	43.43	21.09*	21.09	21.09	17.74*	17.74	17.74
Ethylene	26.16*	26.16	26.16	3.70*	3.70	3.70	2.93*	2.93	2.93
Ethane	10.35*	10.35	10.35	4.64*	4.64	4.64	4.61*	4.61	4.61
Acetylene	7.38*	7.38	7.38	0.00	0.00	0.00	0.00	0.00	0.00
Propane	0.55*	0.55	0.55	0.06*	0.06	0.06	0.04*	0.04	0.04
Propylene	12.16*	12.16	12.16	1.14*	1.14	1.14	1.24*	1.24	1.24
Benzene	16.60*	16.60	16.60	5.76*	5.76	5.76	3.36*	3.36	3.36
Toluene	30.39*	30.39	30.39	5.74*	5.74	5.74	0.00	0.00	0.00
Total Individual HC	146.9*	146.9	146.9	42.1*	42.1	42.1	29.9*	29.9	29.9
Total as % of THC, %	49.0*	49.0	49.0	84.3*	84.3	84.3	74.8*	74.8	74.8
Organic Sulfides									
Carbonyl Sulfide	0.21	0.04	0.52	0.14	0.00	0.51	0.00	0.00	0.00
Methyl Sulfide	0.22	0.00	0.60	0.03	0.00	0.08	0.00	0.00	0.01
Ethyl Sulfide	0.04	0.00	0.07	0.02	0.00	0.05	0.04	0.00	0.14
Methyl Disulfide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Organic Amines									
Monomethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Monoethylamine	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE F-2 (Cont'd). AVERAGE, MINIMUM AND MAXIMUM VALUES FOR THE UNMODIFIED CONFIGURATION
1978 CHEVROLET MALIBU - 49 STATE

		EMISSION RATE, MG/KM (Except at Noted)								
		FTP			SET			HFET		
		AVG	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX
Test Number, PVM-ST		12X-11			12X-12			12X-13		
Other Elements										
Chromium	Cr				0					
Lead	Pb				0.00	0.00	0.01			
Manganese	Mn				0					
Arsenic	As				0					
Mercury	Hg				0					
Bromine	Br				0					
Phosphorus	P				0.00	0.00	0.01			
Silicon	Si	0.01	0.00	0.01	0					
Cadmium	Cd				0					
Aluminum	Al	0.01	0.01	0.02	0.01	0.00	0.01			
Sulfur	S	0.01	0.00	0.02	0.02	0.01	0.02	0.02	0.00	0.05
Sodium	Na									
Fluorine	F									
Magnesium	Mg									
Potassium	K									
Chlorine	Cl	0.01	0.00	0.02						
Platinum	Pt									
Zinc	Zn									
Copper	Cu									
Nickel	Ni									
Iron	Fe	0.07	0.00	0.18	0.07	0.00	0.22			
Vanadium	V									
Titanium	Ti									
Barium	Ba	0.01	0.01	0.02	0.02	0.01	0.02	0.01	0.00	0.01
Calcium	Ca	0.01	0.00	0.02						

*Validity of the average values given is questionable due to insufficient data points or extreme variation of the data points.

TABLE F-3. AVERAGE, MINIMUM AND MAXIMUM VALUES FOR THE UNMODIFIED CONFIGURATION
1978 CHEVROLET MALIBU - CALIFORNIA

	EMISSION RATE, MG/KM (Except as Noted)								
	FTP			SET			HFET		
	AVG	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX
Test Number, PVM-ST	13X-11			13X-12			13X-13		
Barometer, mm Hg	742.8	742.8	744.7	742.8	739.1	745.5	742.8	739.1	745.5
Humidity, g/kg	10.8	8.9	13.9	9.2	8.3	10.4	9.1	7.4	10.0
Temperature, °C	23.5	21.7	25.6	24.0	22.2	25.6	25.4	24.4	26.7
Total Fuel Sulfur, mg/km	36.94	35.94	37.77	28.78	28.26	29.99	24.50	23.60	25.84
Avg. Exh. Oxygen, %	5.26	5.03	5.50	4.68	4.45	4.94	4.28	4.21	4.37
Catalyst Avg. Temp., °C	487.	482.	495.	598.	572.	613.	612.	597.	623.
Catalyst Max. Temp., °C	593.	584.	601.	690.	661.	708.	672.	648.	704.
Carbon Dioxide, g/km	404.1	393.8	409.7	316.7	308.2	327.2	270.1	257.6	281.9
Fuel Cons., ℓ/100 km	17.42	17.02	17.62	13.58	13.19	14.00	11.55	11.01	12.06
Regulated Emissions									
Hydrocarbons, (THC), g/km	0.19	0.17	0.20	0.05	0.04	0.06	0.04	0.03	0.05
Carbon Monoxide, g/km	2.16	1.66	2.88	0.75	0.37	1.76	0.21	0.18	0.27
Oxides of Nitrogen, g/km	0.43	0.37	0.50	0.35	0.33	0.36	0.42	0.37	0.50
Particulates									
Total Particulates	3.42	2.29	5.24	4.66	3.13	6.67	4.09	2.35	6.90
Sulfate	0.73	0.41	1.03	2.75	1.72	3.82	2.59	1.35	3.47
Sulfate as % of TFS, %	0.66	0.36	0.96	3.20	1.91	4.51	1.88	1.86	4.77
Compound Group Totals									
Aldehydes & Ketones	1.5*	0.3	2.3	1.0	0.2	1.8	1.1	0.3	2.1
Individual Hydrocarbons	104.	85.2	136.	27.	20.	39.1	29.6	21.	34.8
Organic Sulfides	0.24	0.10	0.49	0.09	0.00	0.29	0.08	0.00	0.18
Organic Amines	0.01	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Other Compounds									
Ammonia	5.35	2.51	9.34	1.74	1.72	1.76	2.09	0.89	3.29
Cyanide & Cyanogen	0.10	0.02	0.21	0.03	0.00	0.11	0.10	0.06	0.14
DMNA	0.11*	0.11	0.11	--	--	--	--	--	--
Hydrogen Sulfide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nickel Carbonyl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrous Oxide	5.	4.	5.12	3.	2.99	3.	2.	2.	3.

TABLE F-3 (Cont'd). AVERAGE, MINIMUM AND MAXIMUM VALUES FOR THE UNMODIFIED CONFIGURATION
1978 CHEVROLET MALIBU - CALIFORNIA

	EMISSION RATE, MG/KM (Except as Noted)								
	FTP			SET			HFET		
	AVG	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX
Test Number, PVM-ST	13X-11			13X-12			13X-13		
Aldehydes and Ketones									
Formaldehyde	1.20	0.31	1.67	0.41	0.16	0.57	0.59	0.29	0.89
Acetaldehyde	0.16	0.00	0.35	0.33	0.00	0.50	0.27	0.00	0.54
Acetone	0.00	0.00	0.00	0.13	0.00	0.50	0.07	0.00	0.29
Isobutyraldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone	0.05	0.00	0.18	0.06	0.00	0.24	0.08	0.00	0.30
Crotonaldehyde	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.06	0.00	0.23	0.05	0.00	0.21	0.06	0.00	0.18
Benzaldehyde	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	1.5	0.3	2.3	1.0	0.2	1.8	1.1	0.3	2.1
Total as % of THC, %	0.8	0.2	0.8	2.0	0.5	3.0	2.6	0.9	4.2
Individual Hydrocarbons									
Methane	60.	46.15	80.	22.	16.	32.45	22.	17.	25.20
Ethylene	14.	10.	20.	2.	1.	2.58	3.	0.37	4.60
Ethane	10.	8.86	12.	3.	2.	3.72	3.	2.	4.36
Acetylene	1.	0.	1.04	0.	0.	0.	0.00	0.00	0.00
Propane	1.	0.70	1.	0.13	0.	0.38	1.	0.62	1.
Propylene	4.	3.	6.	0.	0.	0.	0.00	0.00	0.00
Benzene	5.	4.	6.	0.	0.	0.	0.	0.00	1.
Toluene	9.	7.66	12.	0.	0.	0.	1.	0.00	3.
Total Individual HC	104.	85.2	136.	27.	20.	39.1	30.	21.	34.8
Total as % of THC, %	54.	47.4	68.	53.	40.	65.2	68.	52.5	82.5
Organic Sulfides									
Carbonyl Sulfide	0.12	0.00	0.41	0.02	0.00	0.06	0.01	0.00	0.02
Methyl Sulfide	0.06	0.02	0.09	0.02	0.00	0.07	0.02	0.00	0.05
Ethyl Sulfide	0.06	0.00	0.18	0.05	0.00	0.21	0.05	0.00	0.14
Methyl Disulfide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Organic Amines									
Monomethylamine	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Monoethylamine	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE F-3 (Cont'd). AVERAGE, MINIMUM AND MAXIMUM VALUES FOR THE UMODIFIED CONFIGURATION
1978 CHEVROLET MALIBU - CALIFORNIA

		EMISSION RATE, MG/KM (Except at Noted)								
		FTP			SET			HFET		
		AVG	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX
Test Number, PVM-ST		13X-11			13X-12			13X-13		
Other Elements										
Chromium	Cr				0					
Lead	Pb				0.15	0.00	0.60			
Manganese	Mn				0					
Arsenic	As				0					
Mercury	Hg				0					
Bromine	Br				0.13	0.00	0.50	0		
Phosphorus	P							0		
Silicon	Si	0.00	0.00	0.01				0.00	0.00	0.01
Cadmium	Cd							0		
Aluminum	Al	0.02	0.01	0.03	0.01	0.01	0.01	0		
Sulfur	S	0.21	0.14	0.30	1.13	0.72	1.55	1.16	0.62	1.64
Sodium	Na									
Fluorine	F									
Magnesium	Mg									
Potassium	K									
Chlorine	Cl	0.00	0.00	0.01	0.00	0.00	0.01			
Platinum	Pt									
Zinc	Zn									
Copper	Cu									
Nickel	Ni									
Iron	Fe	0.04	0.00	0.08	0.01	0.00	0.02			
Vanadium	V									
Titanium	Ti									
Barium	Ba	0.01	0.00	0.02	0.01	0.01	0.01	0.01	0.00	0.01
Calcium	Ca	0.01	0.00	0.05						

*Validity of the average values given is questionable due to insufficient data points or extreme variation of the data points.

TABLE F-4. AVERAGE, MINIMUM AND MAXIMUM VALUES FOR THE UNMODIFIED CONFIGURATION
1978 FORD GRANADA - 49 STATE

	EMISSION RATE, MG/KM (Except as Noted)								
	FTP			SET			HFET		
	AVG	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX
Test Number, PVM-ST	14X-11			14X-12			14X-13		
Barometer, mm Hg	741.4	738.1	743.5	740.5	738.1	743.7	740.5	738.1	743.7
Humidity, g/kg	10.5	9.3	12.2	9.5	8.9	10.7	9.2	8.1	10.2
Temperature, °C	23.3	22.8	23.9	24.2	22.8	25.0	24.7	22.8	26.1
Total Fuel Sulfur, mg/km	32.6	31.96	34.11	25.42	24.69	26.19	22.53	21.34	24.36
Avg. Exh. Oxygen, %	5.24	4.87	5.70	4.52	4.35	4.78	3.29	3.20	3.38
Catalyst Avg. Temp., °C	382.	371.	392.	463.	448.	483.	495.	479.	520.
Catalyst Max. Temp., °C	462.	444.	482.	549.	533.	572.	552.	538.	572.
Carbon Dioxide, g/km	353.5	346.3	369.0	277.1	269.3	285.3	245.7	233.0	265.0
Fuel Cons., ℓ/100 km	15.22	14.91	15.92	11.86	11.52	12.22	10.51	9.96	11.37
Regulated Emissions									
Hydrocarbons, (THC), g/km	0.27	0.25	0.30	0.09	0.07	0.11	0.07	0.05	0.11
Carbon Monoxide, g/km	1.48	1.20	1.88	0.36	0.25	0.47	0.25	0.05	0.62
Oxides of Nitrogen, g/km	1.22	0.96	1.41	0.94	0.88	1.04	0.85	0.77	0.95
Particulates									
Total Particulates	7.55	5.05	9.20	4.69	0.66	10.10	10.81	3.93	23.21
Sulfate	1.15	0.34	2.90	3.78	0.92	5.67	8.46	2.01	14.12
Sulfate as % of TFS, %	1.18	0.35	3.02	5.01	1.17	7.65	12.75	2.75	20.84
Compound Group Totals									
Aldehydes & Ketones	3.4	2.0	4.8	2.2	1.6	3.1	1.8	1.1	3.3
Individual Hydrocarbons	97.	72.	117.	49.9	42.0	57.7	44.	29.	59.1
Organic Sulfides	0.11	0.07	0.15	0.07	0.00	0.13	0.07	0.00	0.10
Organic Amines	0.03	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00
Other Compounds									
Ammonia	1.93	1.26	2.87	0.77*	0.77	0.77	0.76*	0.76	0.76
Cyanide & Cyanogen	0.23	0.01	0.36	0.02	0.00	0.04	0.06	0.00	0.11
DMNA	0.03	0.00	0.10	--	--	--	--	--	--
Hydrogen Sulfide	0.00	0.00	0.00	0.01	0.00	0.05	0.01	0.00	0.02
Nickel Carbonyl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrous Oxide	21.	18.	27.	9.	7.	15.	4.	4.	4.82

TABLE F-4 (Cont'd). AVERAGE, MINIMUM AND MAXIMUM VALUES FOR THE UNMODIFIED CONFIGURATION
1978 FORD GRANADA - 49 STATE

	EMISSION RATE, MG/KM (Except as Noted)								
	FTP			SET			HFET		
	AVG	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX
Test Number, PVM-ST	14X-11			14X-12			14X-13		
Aldehydes and Ketones									
Formaldehyde	2.89	0.91	4.16	1.33	1.09	1.50	0.85	0.52	1.33
Acetaldehyde	0.14	0.00	0.51	0.27	0.00	0.64	0.12	0.00	0.25
Acetone	0.05	0.00	0.15	0.43	0.00	1.58	0.63	0.00	2.53
Isobutyraldehyde	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone	0.17	0.00	0.27	0.08	0.04	0.15	0.13	0.06	0.16
Crotonaldehyde	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.15	0.00	0.31	0.12	0.06	0.25	0.10	0.06	0.15
Benzaldehyde	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	3.4	2.0	4.8	2.2	1.6	3.1	1.8	1.1	3.3
Total as % of THC, %	1.4	0.7	1.9	2.7	1.5	4.4	2.9	1.0	5.5
Individual Hydrocarbons									
Methane	37.	20.	48.	21.55	18.12	24.98	20.	17.	23.54
Ethylene	12.	4.	17.	5.70	5.31	6.08	3.	2.	4.66
Ethane	14.	7.	17.	9.77	9.36	10.18	9.	7.	11.97
Acetylene	0.	0.	1.47	0.00	0.00	0.00	0.	0.	0.
Propane	1.	0.63	1.	0.35	0.20	0.49	0.	0.	0.79
Propylene	5.	2.	7.23	2.57	1.92	3.21	2.	0.	3.50
Benzene	8.	5.	11.	2.96	0.00	5.91	4.	1.	7.36
Toluene	21.	18.	22.	6.97	5.94	7.99	5.	2.	7.32
Total Individual HC	97.	72.	117.	50.	42.0	57.7	44.	29.	59.1
Total as % of THC, %	37.	29.	47.	51.1	38.1	64.1	47.	41.	53.8
Organic Sulfides									
Carbonyl Sulfide	0.04	0.00	0.10	0.02	0.00	0.04	0.01	0.00	0.04
Methyl Sulfide	0.03	0.02	0.04	0.02	0.00	0.07	0.04	0.00	0.09
Ethyl Sulfide	0.04	0.00	0.11	0.03	0.00	0.11	0.03	0.00	0.07
Methyl Disulfide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Organic Amines									
Monomethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Monoethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE F-4 (Cont'd). AVERAGE, MINIMUM AND MAXIMUM VALUES FOR THE UNMODIFIED CONFIGURATION
1978 FORD GRANADA - 49 STATE

		EMISSION RATE, MG/KM (Except at Noted)								
		FTP			SET			HFET		
		AVG	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX
Test Number, PVM-ST		14X-11			14X-12			14X-13		
Other Elements										
Chromium	Cr									
Lead	Pb	0.10	0.00	0.41						
Manganese	Mn	0.00	0.00	0.01						
Arsenic	As									
Mercury	Hg									
Bromine	Br	0.04	0.00	0.15						
Phosphorus	P	0.02	0.00	0.05	0.01	0.00	0.01			
Silicon	Si									
Cadmium	Cd									
Aluminum	Al	0.01	0.00	0.02						
Sulfur	S	0.16	0.07	0.28	1.33	0.36	1.89	3.39	0.87	5.38
Sodium	Na									
Fluorine	F									
Magnesium	Mg	0.01	0.00	0.02	0.00	0.00	0.01			
Potassium	K									
Chlorine	Cl	0.02	0.00	0.03						
Platinum	Pt									
Zinc	Zn	0.01	0.00	0.03						
Copper	Cu									
Nickel	Ni									
Iron	Fe	0.42	0.03	1.38	0.05	0.00	0.11	0.04	0.00	0.05
Vanadium	V									
Titanium	Ti									
Barium	Ba	0.03	0.01	0.06	0.02	0.01	0.02	0.02	0.02	0.03
Calcium	Ca	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.00	0.02

*Validity of the average values given is questionable due to insufficient data points or extreme variation of the data points.

TABLE F-5. AVERAGE, MINIMUM AND MAXIMUM VALUES FOR THE UNMODIFIED CONFIGURATION
1978 FORD MUSTANG II - 49 STATE W/O AIR PUMP

	EMISSION RATE, MG/KM (Except as Noted)								
	FTP			SET			HFET		
	AVG	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX
Test Number, PVM-ST	15X-11			15X-12			15X-13		
Barometer, mm Hg	741.0	740.7	741.4	741.0	740.7	741.4	740.9	740.7	741.4
Humidity, g/kg	10.1	8.8	10.9	8.8	8.6	8.9	9.4	8.6	11.1
Temperature, °C	22.4	21.1	24.4	24.2	22.8	26.1	24.3	22.8	27.2
Total Fuel Sulfur, mg/km	29.79	25.37	32.30	24.92	20.40	27.44	22.72	17.88	25.02
Avg. Exh. Oxygen, %	4.21	3.42	5.40	3.22	2.81	4.03	1.67	1.21	2.17
Catalyst Avg. Temp., °C	450.	431.	470.	548.	517.	569.	609.	583.	623.
Catalyst Max. Temp., °C	580.	542.	601.	646.	618.	661.	663.	644.	696.
Carbon Dioxide, g/km	343.5	339.7	348.2	285.6	280.0	298.0	260.4	245.7	272.7
Fuel Cons., ℓ/100 km	14.93	14.79	15.07	12.25	12.00	12.81	11.15	10.52	11.68
Regulated Emissions									
Hydrocarbons, (THC), g/km	0.32	0.29	0.37	0.10	0.09	0.12	0.07	0.06	0.10
Carbon Monoxide, g/km	3.34	2.56	3.74	0.72	0.58	1.04	0.36	0.30	0.42
Oxides of Nitrogen, g/km	1.02	0.94	1.10	0.95	0.93	1.00	0.93	0.85	1.01
Particulates									
Total Particulates	5.76	3.32	8.28	3.19	1.62	4.89	2.33	1.39	2.81
Sulfate	0.59	0.51	0.65	0.50	0.37	0.62	0.66	0.09	1.44
Sulfate as % of TFS, %	0.67	0.53	0.85	0.69	0.48	0.96	0.92	0.12	2.02
Compound Group Totals									
Aldehydes & Ketones	2.7	1.1	3.8	0.8	0.6	0.9	1.3	0.6	2.3
Individual Hydrocarbons	135.	122.4	148.	51.	37.	60.3	35.	27.	51.4
Organic Sulfides	0.27	0.02	0.53	0.20	0.00	0.54	0.15	0.00	0.39
Organic Amines	0.01	0.00	0.02	0.02	0.00	0.03	0.06	0.00	0.21
Other Compounds									
Ammonia	3.06	2.60	3.52	3.14*	3.14	3.14	2.38*	2.38	2.38
Cyanide & Cyanogen	0.48	0.29	0.66	0.04	0.03	0.04	0.06	0.02	0.09
DMNA	0.01	0.00	0.02	--	--	--	--	--	--
Hydrogen Sulfide	0.11	0.04	0.24	0.09	0.00	0.17	0.37	0.00	0.92
Nickel Carbonyl	--	--	--	0.00	0.00	0.00	0.00	0.00	0.00
Nitrous Oxide	27.*	27.	27.	20.	19.59	21.	16.	10.	22.03

TABLE F-5 (Cont'd). AVERAGE, MINIMUM AND MAXIMUM VALUES FOR THE UNMODIFIED CONFIGURATION
1978 FORD MUSTANG II - 49 STATE W/O AIR PUMP

	EMISSION RATE, MG/KM (Except as Noted)								
	FTP			SET			HFET		
	AVG	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX
Test Number, PVM-ST	15X-11			15X-12			15X-13		
Aldehydes and Ketones									
Formaldehyde	1.58	0.41	2.49	0.48	0.00	0.77	0.35	0.00	0.68
Acetaldehyde	0.63	0.37	1.13	0.10	0.00	0.39	0.41	0.00	1.27
Acetone	0.15	0.00	0.39	0.08	0.00	0.27	0.13	0.00	0.25
Isobutyraldehyde	0.03	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone	0.13	0.04	0.25	0.04	0.00	0.09	0.12	0.00	0.35
Crotonaldehyde	--	--	--	--	--	--	--	--	--
Hexanaldehyde	0.18	0.10	0.25	0.05	0.00	0.11	0.29	0.07	0.53
Benzaldehyde	--	--	--	--	--	--	--	--	--
Aldehydes and Ketones	2.7	1.1	3.8	0.8	0.6	0.9	1.3	0.6	2.3
Total as % of THC, %	0.8	0.4	1.1	0.6	0.0	1.0	2.0	1.0	3.8
Individual Hydrocarbons									
Methane	45.	36.61	53.	25.	23.	26.67	21.	16.	27.67
Ethylene	24.	19.49	28.	3.	2.	4.55	1.	0.	2.44
Ethane	8.	5.	11.96	7.	5.	10.79	6.	3.	10.67
Acetylene	0.32	0.	0.64	0.	0.	0.	0.00	0.00	0.00
Propane	2.	1.42	3.	1.	2.	1.	1.	0.	2.01
Propylene	12.	11.28	13.	1.	0.	2.79	0.	0.	1.37
Benzene	14.	13.64	15.	4.	2.	6.59	2.	1.	2.21
Toluene	29.	27.35	31.	9.	2.	17.	4.	1.	6.
Total Individual HC	135.	122.4	148.	51.	37.	60.3	35.	27.	51.4
Total as % of THC, %	41.	40.	42.2	56.	50.3	62.	42.	31.	51.4
Organic Sulfides									
Carbonyl Sulfide	0.16	0.00	0.42	0.08	0.00	0.20	0.07	0.00	0.19
Methyl Sulfide	0.11	0.02	0.19	0.09	0.00	0.26	0.01	0.00	0.02
Ethyl Sulfide	0.01	0.00	0.02	0.03	0.00	0.08	0.07	0.00	0.28
Methyl Disulfide	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.04
Organic Amines									
Monomethylamine	0.01	0.00	0.02	0.00	0.00	0.01	0.03	0.00	0.12
Monoethylamine	0.00	0.00	0.01	0.01	0.00	0.02	0.03	0.00	0.09
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE F-5 (Cont'd). AVERAGE, MINIMUM AND MAXIMUM VALUES FOR THE UNMODIFIED CONFIGURATION
1978 FORD MUSTANG II - 49 STATE W/O AIR PUMP

		EMISSION RATE, MG/KM (Except at Noted)								
		FTP			SET			HFET		
		AVG	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX
Test Number, PVM-ST		15X-11			15X-12			15X-13		
Other Elements										
Chromium	Cr									
Lead	Pb									
Manganese	Mn	0.00	0.00	0.01						
Arsenic	As									
Mercury	Hg									
Bromine	Br									
Phosphorus	P	0.01	0.00	0.03						
Silicon	Si	0.00	0.00	0.01						
Cadmium	Cd									
Aluminum	Al	0.00	0.00	0.01	0.00	0.00	0.01			
Sulfur	S	0.05	0.01	0.11	0.15	0.11	0.22	0.33	0.06	0.60
Sodium	Na									
Fluorine	F									
Magnesium	Mg	0.01	0.00	0.01						
Potassium	K									
Chlorine	Cl	0.03	0.00	0.05	0.01	0.00	0.04			
Platinum	Pt									
Zinc	Zn									
Copper	Cu									
Nickel	Ni									
Iron	Fe	0.27	0.00	0.73	0.04	0.00	0.11	0.02	0.00	0.04
Vanadium	V									
Titanium	Ti									
Barium	Ba	0.02	0.01	0.03	0.02	0.01	0.02	0.01	0.00	0.01
Calcium	Ca									

*Validity of the average values given is questionable due to insufficient data points or extreme variation of the data points.

APPENDIX G

AVERAGE VALUES FOR ALL CONFIGURATIONS

	Car	Description
TABLES G-1 through G-3	11	1977 AMC Pacer
TABLES G-4 through G-6	12	1978 Chevrolet Malibu
TABLES G-7 through G-9	13	1978 Chev. Malibu (Calif.)
TABLES G-10 through G-12	14	1978 Ford Granada
TABLES G-13 through G-15	15	1978 Ford Mustang II

TABLE G-1. CAR 11 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - FTP
1977 AMC PACER - 49 STATE W/O CATALYST

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	High Oil Consump.
Test No.	PVM	11	111	112	113	114
Barometer,	mm Hg	743.6	735.1	742.6	741.0	740.1
Humidity,	g/kg	10.2	9.5	10.4	11.5	11.1
Temperature,	°C	24.3	23.1	24.2	23.1	22.5
Total Fuel Sulfur,	mg/km	30.70	32.27	33.41	30.63	32.17
Avg. Exh. Oxygen,	%	6.0	3.88	6.91	5.71	5.64
Catalyst Avg. Temp.,	°C	--	--	--	--	--
Catalyst Max. Temp.,	°C	--	--	--	--	--
Carbon Dioxide,	g/km	318.9	332.6	308.1	312.5	309.4
Fuel Cons.,	ℓ/100 km	14.46	15.70	15.59	14.29	15.01
Regulated Emissions						
Hydrocarbons (THC),	g/km	0.73	0.81	10.82	0.79	1.12
Carbon Monoxide,	g/km	11.14	20.79	14.52	12.63	24.70
Oxides of Nitrogen,	g/km	1.21	1.18	1.71	2.25	1.24
Particulates						
Total Particulates		31.3	26.3	48.2	16.3	42.6
Sulfate		0.68	0.27	1.11	0.59	1.30
Compound Group Totals						
Aldehydes & Ketones		13.4	15.2	123.5	15.4	31.3
Individual Hydrocarbons		316.	396.	1354.	--	--
Organic Sulfides		0.20	0.33	0.41	--	0.17
Organic Amines		0.03	0.09	0.22	0.02	0.00
Other Compounds						
Ammonia		3.05	1.99	2.08	3.31	--
Cyanide & Cyanogen		2.35	1.72	0.72	4.11	--
DMNA		--	--	--	--	--
Hydrogen Sulfide		0.04	0.11	0.46	0.11	0.31
Nickel Carbonyl		0.00	0.00	--	--	--
Nitrous Oxide		3.	3.0	4.	--	--
Aldehydes and Ketones						
Formaldehyde		9.71	12.62	75.24	11.06	21.73
Acetaldehyde		2.35	2.23	31.04	2.20	7.23
Acetone		0.77	0.08	10.00	1.01	1.27
Isobutyraldehyde		0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone		0.35	0.15	5.30	1.00	0.64
Crotonaldehyde		--	--	--	--	--
Hexanaldehyde		0.19	0.08	1.92	0.17	0.44
Benzaldehyde		--	--	--	--	--

TABLE G-1 (Cont'd). CAR 11 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - FTP
1977 AMC PACER - 49 STATE W/O CATALYST

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	High Oil Consump.
Individual Hydrocarbons						
Methane		48.	91.8	58.	--	--
Ethylene		83.	95.8	119.	--	--
Ethane		7.	6.7	10.	--	--
Acetylene		35.	53.2	36.	--	--
Propane		5.	1.3	5.	--	--
Propylene		38.	38.1	96.	--	--
Benzene		40.	52.0	230.	--	--
Toluene		60.	57.5	800.	--	--
Organic Sulfides						
Carbonyl Sulfide		0.11	0.18	0.40	--	0.10
Methyl Sulfide		0.05	0.04	0.00	--	0.07
Ethyl Sulfide		0.02	0.06	0.01	--	0.01
Methyl Disulfide		0.02	0.06	0.01	--	0.00
Organic Amines						
Monomethylamine		0.01	0.01	0.08	0.02	0.00
Monoethylamine		0.02	0.05	0.02	0.01	0.00
Trimethylamine		0.00	0.03	0.12	0.00	0.00
Diethylamine		0.00	0.00	0.00	0.00	0.00
Triethylamine		0.00	0.00	0.00	0.00	0.00
Other Elements[a]						
Manganese	Mn				--	
Phosphorus	P	0.01	0.01	0.02	--	0.48
Silicon	Si				--	0.01
Aluminum	Al				--	
Sulfur	S	0.05	0.04	0.08	--	0.11
Sodium	Na				--	
Magnesium	Mg				--	0.25
Potassium	K				--	
Chlorine	Cl	0.01		0.04	--	0.09
Zinc	Zn	0.01			--	0.35
Copper	Cu				--	
Nickel	Ni				--	
Iron	Fe	0.15	0.13	0.11	--	0.45
Barium	Ba	0.01	0.02	0.02	--	0.72
Calcium	Ca	0.01	0.01	0.01	--	0.02

*Validity of the average value given is questionable.

[a] This table excludes lead, bromine and all elements having measured emissions values consistently below 0.01 mg/km.

Note: For Other Elements, a blank space indicates a 0.00 value.

TABLE G-2. CAR 11 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - SET
1977 AMC PACER - 49 STATE W/O CATALYST

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	High Oil Consump.
Test No.	PVM	11	111	112	113	114
Barometer,	mm Hg	741.4	734.6	742.4	741.1	739.9
Humidity,	g/kg	9.5	8.9	10.8	9.6	9.8
Temperature,	°C	25.0	26.1	27.3	25.0	24.7
Total Fuel Sulfur,	mg/km	24.66	25.44	27.96	23.31	25.55
Avg. Exh. Oxygen,	%	5.30	4.15	6.12	5.59	5.09
Catalyst Avg. Temp.,	°C	--	--	--	--	--
Catalyst Max. Temp.,	°C	--	--	--	--	--
Carbon Dioxide,	g/km	265.5	279.7	266.3	248.8	262.5
Fuel Cons.,	ℓ/100 km	11.63	12.38	13.05	10.88	11.93
Regulated Emissions						
Hydrocarbons (THC),	g/km	0.37	0.28	8.09	0.41	0.53
Carbon Monoxide,	g/km	3.65	6.01	8.76	3.01	9.68
Oxides of Nitrogen,	g/km	1.24	1.26	1.40	3.47	1.30
Particulates						
Total Particulates		14.8	8.7	29.2	9.8	23.9
Sulfate		0.32	0.19	1.00	0.24	0.69
Compound Group Totals						
Aldehydes & Ketones		14.0	12.1	152.1	8.3	22.3
Individual Hydrocarbons		138.	163.	659.	--	--
Organic Sulfides		0.07	0.15	0.07	0.02	0.04
Organic Amines		0.02	0.07	0.07	0.01	0.02
Other Compounds						
Ammonia		1.1 *	1.56	--	--	--
Cyanide & Cyanogen		0.79	0.65	0.15	0.88	--
DMNA		--	--	--	--	--
Hydrogen Sulfide		0.00	0.00	0.14	--	0.04
Nickel Carbonyl		0.00	0.00	--	--	--
Nitrous Oxide		3.	3.5	--	--	3.
Aldehydes and Ketones						
Formaldehyde		10.66	9.81	89.45	5.91	17.21
Acetaldehyde		2.53	2.09	39.87	1.45	3.99
Acetone		0.33	0.00	13.73	0.55	0.64
Isobutyraldehyde		0.00	0.00	0.41	0.00	0.00
Methyl Ethyl Ketone		0.33	0.10	6.21	0.29	0.33
Crotonaldehyde		--	--	--	--	--
Hexanaldehyde		0.14	0.06	2.40	0.10	0.09
Benzaldehyde		--	--	--	--	--

TABLE G-2 (Cont'd). CAR 11 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - SET
1977 AMC PACER - 49 STATE W/O CATALYST

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	High Oil Consump.
Individual Hydrocarbons						
Methane		13.	20.8	21.	--	--
Ethylene		46.	60.5	75.	--	--
Ethane		3.	2.3	6.	--	--
Acetylene		15.	17.8	13.	--	--
Propane		1.	0.0	3.	--	--
Propylene		20.	23.0	66.	--	--
Benzene		18.	23.1	103.	--	--
Toluene		22.	14.6	373.	--	--
Organic Sulfides						
Carbonyl Sulfide		0.01	0.02	0.06	0.01	0.01
Methyl Sulfide		0.04	0.06	0.00	0.01	0.04
Ethyl Sulfide		0.02	0.06	0.01	0.00	0.00
Methyl Disulfide		0.00	0.02	0.00	0.00	0.00
Organic Amines						
Monomethylamine		0.01	0.01	0.07	0.01	0.01
Monoethylamine		0.01	0.04	0.00	0.01	0.01
Trimethylamine		0.00	0.03	0.00	0.00	0.00
Diethylamine		0.00	0.00	0.00	0.00	0.00
Triethylamine		0.00	0.00	0.00	0.00	0.00
Other Elements[a]						
Manganese	Mn					
Phosphorus	P	0.01	0.02	0.02	0.01	0.51
Silicon	Si					0.01
Aluminum	Al					
Sulfur	S	0.07	0.10	0.07	0.03	0.10
Sodium	Na					0.04
Magnesium	Mg					0.19
Potassium	K					
Chlorine	Cl					0.06
Zinc	Zn					0.32
Copper	Cu					
Nickel	Ni					
Iron	Fe	0.04	0.03	0.03	0.03	0.11
Barium	Ba	0.01	0.02	0.02	0.01	0.56
Calcium	Ca	0.01		0.01		0.02

*Validity of the average value given is questionable.

[a] This table excludes lead, bromine and all elements having measured emissions values consistently below 0.01 mg/km.

Note: For Other Elements, a blank space indicates a 0.00 value.

TABLE G-3. CAR 11 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - HFET
1977 AMC PACER - 49 STATE W/O CATALYST

	Average Emission Rate, mg/km (Except as Noted)				
	Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	High Oil Consump.
Test No. PVM	11	111	112	113	114
Barometer, mm Hg	741.4	735.4	742.4	741.1	739.9
Humidity, g/kg	10.0	9.1	11.3	9.5	9.4
Temperature, °C	25.3	26.4	28.1	24.5	24.7
Total Fuel Sulfur, mg/km	22.26	22.67	25.91	20.83	21.51
Avg. Exh. Oxygen, %	4.81	4.73	--	5.09	4.55
Catalyst Avg. Temp., °C	--	--	--	--	--
Catalyst Max. Temp., °C	--	--	--	--	--
Carbon Dioxide, g/km	241.5	253.7	246.6	224.1	229.5
Fuel Cons., ℓ/100 km	10.49	11.03	12.09	9.72	10.04
Regulated Emissions					
Hydrocarbons (THC), g/km	0.31	0.26	7.54	0.35	0.32
Carbon Monoxide, g/km	2.11	2.47	8.10	1.61	2.98
Oxides of Nitrogen, g/km	1.40	1.43	1.57	3.83	1.38
Particulates					
Total Particulates	12.9	10.0	25.0	6.8	19.6
Sulfate	0.24	0.21	0.83	0.21	0.51
Compound Group Totals					
Aldehydes & Ketones	16.6	8.6	228.1	7.3	16.4
Individual Hydrocarbons	161.	154.	1224.	--	--
Organic Sulfides	0.07	0.10	0.05	0.02	0.04
Organic Amines	0.01	0.05	0.05	0.02	0.03
Other Compounds					
Ammonia	1.3 *	1.92	--	--	--
Cyanide & Cyanogen	1.60	2.14	0.33	7.06	--
DMNA	--	--	--	--	--
Hydrogen Sulfide	0.00	0.00	0.14	0.00	0.00
Nickel Carbonyl	0.00	0.00	--	--	--
Nitrous Oxide	4.	4.3	4.	--	2.
Aldehydes and Ketones					
Formaldehyde	10.86	6.86	150.54	5.34	11.79
Acetaldehyde	3.80	1.49	50.98	0.78	3.90
Acetone	0.96	0.00	14.58	0.59	0.49
Isobutyraldehyde	0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone	0.68	0.20	8.83	0.35	0.16
Crotonaldehyde	--	--	--	--	--
Hexanaldehyde	0.25	0.07	3.11	0.21	0.09
Benzaldehyde	--	--	--	--	--

TABLE G-3 (Cont'd). CAR 11 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - HFET
1977 AMC PACER - 49 STATE W/O CATALYST

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	High Oil Consump.
Individual Hydrocarbons						
Methane		21.	12.0	34.	--	--
Ethylene		51.	58.0	203.	--	--
Ethane		3.	2.1	16.	--	--
Acetylene		16.	18.1	24.	--	-
Propane		3.	0.0	4.	--	--
Propylene		22.	22.9	179.	--	--
Benzene		20.	22.1	172.	--	--
Toluene		27.	18.8	593.	--	--
Organic Sulfides						
Carbonyl Sulfide		0.02	0.06	0.04	0.00	0.02
Methyl Sulfide		0.05	0.01	0.00	0.01	0.02
Ethyl Sulfide		0.01	0.04	0.01	0.01	0.00
Methyl Disulfide		0.00	0.01	0.00	0.00	0.00
Organic Amines						
Monomethylamine		0.01	0.00	0.05	0.02	0.01
Monoethylamine		0.00	0.04	0.00	0.00	0.02
Trimethylamine		0.00	0.02	0.00	0.00	0.00
Diethylamine		0.00	0.00	0.00	0.00	0.00
Triethylamine		0.00	0.00	0.00	0.00	0.00
Other Elements [a]						
Manganese	Mn					
Phosphorus	P		0.02	0.02		0.21
Silicon	Si					0.21
Aluminum	Al					
Sulfur	S	0.06	0.08	0.03	0.03	0.05
Sodium	Na					
Magnesium	Mg					0.13
Potassium	K					
Chlorine	Cl	0.01				0.01
Zinc	Zn					0.25
Copper	Cu				0.03	0.03
Nickel	Ni					
Iron	Fe	0.02				0.04
Barium	Ba	0.01	0.01	0.02	0.01	0.36
Calcium	Ca					0.01

*Validity of the average value given is questionable.

[a] This table excludes lead, bromine and all elements having measured emissions values consistently below 0.01 mg/km.

Note: For Other Elements, a blank space indicates a 0.00 value.

TABLE G-4. CAR 12 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - FTP
1978 CHEVROLET MALIBU - 49 STATE

	Average Emission Rate, mg/km (Except as Noted)				
	Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	High Oil Consump.
Test No. PVM	12	121	122	123	124
Barometer, mm Hg	742.4	736.0	739.3	740.4	738.1
Humidity, g/kg	12.2	9.7	10.1	10.8	11.4
Temperature, °C	23.8	24.2	21.7	21.4	22.5
Total Fuel Sulfur, mg/km	29.11	30.12	31.05	28.33	29.87
Avg. Exh. Oxygen, %	2.07	1.30	2.31	2.33	1.35
Catalyst Avg. Temp., °C	384.	370.	488.	380.	385.
Catalyst Max. Temp., °C	477.	483.	632.	481.	476.
Carbon Dioxide, g/km	312.0	299.1	323.1	298.7	307.8
Fuel Cons., ℓ/100 km	13.73	14.66	14.49	13.22	13.94
Regulated Emissions					
Hydrocarbons (THC), g/km	0.31	1.08	1.78	0.34	0.57
Carbon Monoxide, g/km	5.54	26.02	6.84	6.33	10.81
Oxides of Nitrogen, g/km	0.75	0.57	0.91	1.11	0.57
Particulates					
Total Particulates	5.85	9.42	4.20	6.55	9.45
Sulfate	0.95*	0.41	0.28	0.27	2.84
Compound Group Totals					
Aldehydes & Ketones	1.7	2.0	5.0	3.7	0.8
Individual Hydrocarbons	146. *	526.	--	--	--
Organic Sulfides	0.47	1.16	0.06	0.11	0.27
Organic Amines	0.00	0.12	0.01	0.00	0.01
Other Compounds					
Ammonia	3.06	17.92	6.87	2.55	--
Cyanide & Cyanogen	0.60	2.79	2.65	1.88	--
DMNA	--	--	--	--	--
Hydrogen Sulfide	0.00	0.12	0.00	0.00	0.00
Nickel Carbonyl	0.00	0.00	--	--	--
Nitrous Oxide	41.	57.3	26.	54.	32.
Aldehydes and Ketones					
Formaldehyde	1.10	1.31	2.29	2.22	0.17
Acetaldehyde	0.31	0.41	2.12	0.88	0.20
Acetone	0.05	0.00	0.30	0.27	0.09
Isobutyraldehyde	0.00	0.03	0.00	0.00	0.03
Methyl Ethyl Ketone	0.06	0.20	0.18	0.19	0.15
Crotonaldehyde	--	--	--	--	--
Hexanaldehyde	0.11	0.04	0.10	0.11	0.10
Benzaldehyde	--	--	--	--	--

TABLE G-4 (Cont'd). CAR 12 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - FTP
1978 CHEVROLET MALIBU - 49 STATE

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	High Oil Consump.
Individual Hydrocarbons						
Methane		43.4 *	123.4	--	--	--
Ethylene		26.1 *	131.0	--	--	--
Ethane		10.3 *	24.1	--	--	--
Acetylene		7.3 *	12.4	--	--	--
Propane		0.5 *	2.0	--	--	--
Propylene		12.1 *	48.4	--	--	--
Benzene		16.6 *	86.0	--	--	--
Toluene		30.3 *	98.7	--	--	--
Organic Sulfides						
Carbonyl Sulfide		0.21	1.06	0.05	0.09	0.17
Methyl Sulfide		0.22	0.01	0.03	0.01	0.07
Ethyl Sulfide		0.04	0.14	0.00	0.01	0.03
Methyl Disulfide		0.00	0.02	0.00	0.00	0.00
Organic Amines						
Monomethylamine		0.00	0.00	0.00	0.00	0.00
Monoethylamine		0.00	0.10	0.01	0.00	0.01
Trimethylamine		0.00	0.03	0.00	0.00	0.00
Diethylamine		0.00	0.00	0.00	0.00	0.00
Triethylamine		0.00	0.00	0.00	0.00	0.00
Other Elements[a]						
Manganese	Mn					0.01
Phosphorus	P					0.24
Silicon	Si	0.01		0.01	0.02	0.01
Aluminum	Al	0.01	0.03	0.02	0.01	
Sulfur	S	0.01	0.03	0.03	0.12	0.04
Sodium	Na					
Magnesium	Mg					0.19
Potassium	K					
Chlorine	Cl	0.01	0.01		0.03	0.17
Zinc	Zn				0.03	0.14
Copper	Cu					
Nickel	Ni				0.11	
Iron	Fe	0.07	0.51	0.10	0.65	0.06
Barium	Ba	0.01	0.01	0.02	0.01	0.52
Calcium	Ca	0.01			0.02	0.01

*Validity of the average value given is questionable.

[a] This table excludes lead, bromine and all elements having measured emissions values consistently below 0.01 mg/km.
For Other Elements, a blank space indicates a 0.00 value.

TABLE G-5 . CAR 12 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - SET
1978 CHEVROLET MALIBU - 49 STATE

	Average Emission Rate, mg/km (Except as Noted)				
	Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	High Oil Consump.
Test No. PVM	12	121	122	123	124
Barometer, mm Hg	743.0	736.1	739.4	741.3	738.5
Humidity, g/kg	9.8	10.2	8.7	9.0	10.0
Temperature, °C	24.1	24.7	23.4	23.4	23.6
Total Fuel Sulfur, mg/km	22.60	23.74	24.17	21.89	22.97
Avg. Exh. Oxygen, %	1.84	0.93	1.88	1.75	1.09
Catalyst Avg. Temp., °C	492.	495.	633.	502.	503.
Catalyst Max. Temp., °C	586.	608.	756.	604.	592.
Carbon Dioxide, g/km	247.9	256.1	256.6	236.0	242.1
Fuel Cons., ℓ/100 km	10.70	11.56	11.28	10.21	10.72
Regulated Emissions					
Hydrocarbons (THC), g/km	0.05	0.34	0.28	0.07	0.21
Carbon Monoxide, g/km	1.02	8.58	4.33	1.99	5.36
Oxides of Nitrogen, g/km	0.92	0.87	1.07	1.42	0.73
Particulates					
Total Particulates	1.37	2.60	0.68	1.66	3.86
Sulfate	0.11	0.14	0.14	0.07	0.19
Compound Group Totals					
Aldehydes & Ketones	1.6	0.1	0.9	1.5	0.3
Individual Hydrocarbons	42. *	229.	--	--	--
Organic Sulfides	0.19	0.66	0.05	0.04	0.59
Organic Amines	0.00	0.09	0.02	0.00	0.00
Other Compounds					
Ammonia	2.21*	21.79	--	--	--
Cyanide & Cyanogen	0.15	1.73	1.94	0.78	--
DMNA	--	--	--	--	--
Hydrogen Sulfide	0.01	2.36	0.00	0.02	0.20
Nickel Carbonyl	0.00	0.00	--	--	--
Nitrous Oxide	29.	44.5	12.	70.	16.
Aldehydes and Ketones					
Formaldehyde	0.94	0.07	0.25	1.06	0.00
Acetaldehyde	0.15	0.00	0.30	0.23	0.18
Acetone	0.40	0.00	0.22	0.09	0.00
Isobutyraldehyde	0.00	0.00	0.00	0.00	0.03
Methyl Ethyl Ketone	0.06	0.02	0.05	0.09	0.06
Crotonaldehyde	--	--	--	--	--
Hexanaldehyde	0.10	0.00	0.05	0.04	0.03
Benzaldehyde	--	--	--	--	--

TABLE G-5 (Cont'd). CAR 12 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - SET
1978 CHEVROLET MALIBU - 49 STATE

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	High Oil Consump.
Individual Hydrocarbons						
Methane		21.0 *	55.0	--	--	--
Ethylene		3.7 *	45.1	--	--	--
Ethane		4.6 *	11.5	--	--	--
Acetylene		0.0	0.0	--	--	--
Propane		0.0 *	0.7	--	--	--
Propylene		1.1 *	19.5	--	--	--
Benzene		5.7 *	51.2	--	--	--
Toluene		5.7 *	45.8	--	--	--
Organic Sulfides						
Carbonyl Sulfide		0.14	--	0.01	0.01	0.44
Methyl Sulfide		0.03	0.08	0.04	0.02	0.05
Ethyl Sulfide		0.02	0.44	0.00	0.01	0.10
Methyl Disulfide		0.00	0.14	0.00	0.00	0.01
Organic Amines						
Monomethylamine		0.00	0.02	0.00	0.00	0.00
Monoethylamine		0.00	0.08	0.02	0.00	0.00
Trimethylamine		0.00	0.00	0.00	0.00	0.00
Diethylamine		0.00	0.00	0.00	0.00	0.00
Triethylamine		0.00	0.00	0.00	0.00	0.00
Other Elements [a]						
Manganese	Mn					0.02
Phosphorus	P			0.01		0.23
Silicon	Si					0.01
Aluminum	Al	0.01	0.01	0.02		0.01
Sulfur	S	1.13	0.03	0.06	0.01	0.03
Sodium	Na					
Magnesium	Mg					0.18
Potassium	K					
Chlorine	Cl			0.02		0.16
Zinc	Zn					0.13
Copper	Cu					
Nickel	Ni					
Iron	Fe	0.01	0.21	0.06	0.04	0.04
Barium	Ba	0.01	0.01	0.01	0.01	0.49
Calcium	Ca					0.01

*Validity of the average value given is questionable.

[a] This table excludes lead, bromine and all elements having measured emissions values consistently below 0.01 mg/km.

For Other Elements, a blank space indicates a 0.00 value.

TABLE G-6. CAR 12 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - HFET
1978 CHEVROLET MALIBU - 49 STATE

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	High Oil Consump.
Test No.	PVM	12	121	122	123	124
Barometer,	mm Hg	742.6	736.1	739.4	741.3	738.3
Humidity,	g/kg	9.6	10.2	9.1	8.5	9.5
Temperature,	°C	24.6	24.7	25.6	24.5	24.7
Total Fuel Sulfur,	mg/km	20.14	20.13	22.01	19.80	21.22
Avg. Exh. Oxygen,	%	1.36	1.98	0.95	1.11	0.67
Catalyst Avg. Temp.,	°C	547.	517.	722.	565.	565.
Catalyst Max. Temp.,	°C	600.	617.	775.	621.	617.
Carbon Dioxide,	g/km	221.5	226.1	237.3	214.6	227.7
Fuel Cons.,	ℓ/100 km	9.49	9.80	10.27	9.24	9.90
Regulated Emissions						
Hydrocarbons (THC),	g/km	0.03	0.10	0.09	0.05	0.10
Carbon Monoxide,	g/km	0.49	1.98	1.97	1.13	2.54
Oxides of Nitrogen,	g/km	1.02	1.10	1.30	1.56	0.85
Particulates						
Total Particulates		1.12	2.74	0.70	0.75	4.57
Sulfate		0.11	0.05	0.12	0.08	0.14
Compound Group Totals						
Aldehydes & Ketones		0.9	6.5	0.5	1.2	0.3
Individual Hydrocarbons		30. *	65.	--	--	--
Organic Sulfides		0.04	--	0.05	0.01	0.33
Organic Amines		0.00	0.14	0.02	0.00	0.00
Other Compounds						
Ammonia		4.9 *	13.26	1.54	--	--
Cyanide & Cyanogen		0.16	0.84	--	0.58	--
DMNA		--	--	--	--	--
Hydrogen Sulfide		0.01	1.00	0.00	0.06	0.20
Nickel Carbonyl		0.00	0.00	--	--	--
Nitrous Oxide		16.5 *	27.1	10.0	--	16.
Aldehydes and Ketones						
Formaldehyde		0.93	0.44	0.38	0.88	0.00
Acetaldehyde		0.18	0.00	0.00	0.00	0.08
Acetone		0.00	--	0.00	0.00	0.00
Isobutyraldehyde		0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone		0.26	0.09	0.03	0.15	0.03
Crotonaldehyde		--	--	--	--	--
Hexanaldehyde		0.20	0.04	0.09	0.14	0.18
Benzaldehyde		--	--	--	--	--

TABLE G-6 (Cont'd). CAR 12 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - HFET
1978 CHEVROLET MALIBU - 49 STATE

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	High Oil Consump.
Individual Hydrocarbons						
Methane		17.7 *	26.0	--	--	--
Ethylene		2.9 *	8.3	--	--	--
Ethane		4.6 *	6.2	--	--	--
Acetylene		0.0	0.0	--	--	--
Propane		0.0 *	0.3	--	--	--
Propylene		1.2	3.3	--	--	--
Benzene		3.4 *	14.6	--	--	--
Toluene		0.0	6.6	--	--	--
Organic Sulfides						
Carbonyl Sulfide		0.00	--	0.03	0.00	0.23
Methyl Sulfide		0.00	--	0.02	0.00	0.05
Ethyl Sulfide		0.04	--	0.00	0.01	0.04
Methyl Disulfide		0.00	--	0.00	0.00	0.01
Organic Amines						
Monomethylamine		0.00	0.01	0.00	0.00	0.00
Monoethylamine		0.00	0.13	0.02	0.00	0.00
Trimethylamine		0.00	0.00	0.00	0.00	0.00
Diethylamine		0.00	0.00	0.00	0.00	0.00
Triethylamine		0.00	0.00	0.00	0.00	0.00
Other Elements [a]						
Manganese	Mn					
Phosphorus	P					0.14
Silicon	Si					
Aluminum	Al					
Sulfur	S	0.02	0.02	0.05	0.02	0.02
Sodium	Na					
Magnesium	Mg					0.10
Potassium	K					
Chlorine	Cl					0.10
Zinc	Zn					0.07
Copper	Cu					
Nickel	Ni					
Iron	Fe		0.07			
Barium	Ba	0.01	0.01	0.01	0.01	0.28
Calcium	Ca					

*Validity of the average value given is questionable.

[a] This table excludes lead, bromine and all elements having measured emissions values consistently below 0.01 mg/km.

Note: For Other Elements, a blank space indicates a 0.00 value.

TABLE G-7. CAR 13 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - FTP 1978 CHEVROLET MALIBU CALIFORNIA WITH AIR PUMP

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	No Air Inj. +R.B.I.
Test No.	PVM	13	131	132	133	135
Barometer,	mm Hg	742.8	741.3	744.4	741.5	742.8
Humidity,	g/kg	10.8	10.3	10.7	9.9	10.1
Temperature,	°C	23.5	25.0	22.3	22.8	22.3
Total Fuel Sulfur,	mg/km	36.94	39.40	38.18	32.56	38.26
Avg. Exh. Oxygen,	%	5.26	3.28	5.18	5.40	0.89
Catalyst Avg. Temp.,	°C	487.	602.	585.	--	420.
Catalyst Max. Temp.,	°C	593.	720.	711.	--	525.
Carbon Dioxide,	g/km	404.1	440.2	410.1	353.1	331.2
Fuel Cons.,	ℓ/100 km	17.42	19.04	17.81	15.20	17.85
Regulated Emissions						
Hydrocarbons (THC),	g/km	0.19	0.18	1.12	0.15	1.24
Carbon Monoxide,	g/km	2.16	3.44	2.33	1.58	52.93
Oxides of Nitrogen,	g/km	0.43	0.35	0.71	1.40	0.28
Particulates						
Total Particulates		3.42	--	5.55	3.10	15.31
Sulfate		0.73	2.04	1.77	0.45	0.73
Compound Group Totals						
Aldehydes & Ketones		1.5*	4.3	6.9	5.3	11.5
Individual Hydrocarbons		104.	--	--	61.	--
Organic Sulfides		0.24	--	0.38	--	0.23
Organic Amines		0.01	0.06	0.01	0.06	0.05
Other Compounds						
Ammonia		5.35	3.11	2.47	1.98	12.50
Cyanide & Cyanogen		0.10	0.27	0.13	0.20	1.57
DMNA		--	--	--	--	--
Hydrogen Sulfide		0.00	0.00	0.00	0.00	0.12
Nickel Carbonyl		0.00	0.00	--	--	--
Nitrous Oxide		5.	2.	6.	10.	7.
Aldehydes and Ketones						
Formaldehyde		1.20	1.12	4.47	4.92	1.55
Acetaldehyde		0.16	1.33	1.74	0.00	3.46
Acetone		0.00	0.27	0.46	0.07	2.14
Isobutyraldehyde		0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone		0.05	0.64	0.04	0.05	4.05
Crotonaldehyde		--	--	--	--	--
Hexanaldehyde		0.06	0.87	0.10	0.17	0.35
Benzaldehyde		--	--	--	--	--

TABLE G-7. (Cont'd). CAR 13 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - FTP
1978 CHEVROLET MALIBU CALIFORNIA WITH AIR PUMP

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	No Air Inj. + R.B.I.
Individual Hydrocarbons						
Methane		60.	--	--	26.	--
Ethylene		14.	--	--	8.	--
Ethane		10.	--	--	5.	--
Acetylene		1.	--	--	1.	--
Propane		1.	--	--	0.	--
Propylene		4.	--	--	3.	--
Benzene		5.	--	--	5.	--
Toluene		9.	--	--	13.	--
Organic Sulfides						
Carbonyl Sulfide		0.12	--	0.22	--	0.22
Methyl Sulfide		0.06	--	0.15	--	0.01
Ethyl Sulfide		0.06	--	0.01	--	0.00
Methyl Disulfide		0.00	--	0.00	--	0.00
Organic Amines						
Monomethylamine		0.00	0.01	0.01	0.02	0.03
Monoethylamine		0.01	0.05	0.00	0.04	0.02
Trimethylamine		0.00	0.00	0.00	0.00	0.00
Diethylamine		0.00	0.00	0.00	0.00	0.00
Triethylamine		0.00	0.00	0.00	0.00	0.00
Other Elements[a]						
Manganese	Mn					
Phosphorus	P					
Silicon	Si			0.01		
Aluminum	Al	0.02	0.02	0.04	0.01	0.02
Sulfur	S	0.21	0.67	0.86	0.17	0.01
Sodium	Na					
Magnesium	Mg					
Potassium	K					
Chlorine	Cl			0.07		
Zinc	Zn			0.01		
Copper	Cu			0.02		
Nickel	Ni			0.06		
Iron	Fe	0.04	0.18	0.44	0.01	0.01
Barium	Ba	0.01		0.02	0.01	0.01
Calcium	Ca	0.01		0.02	0.01	

*Validity of the average value given is questionable.

[a] This table excludes lead, bromine and all elements having measured emissions values consistently below 0.01 mg/km.

Note: For Other Elements, a blank space indicates a 0.00 value.

TABLE G-8. CAR 13 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - SET
1978 CHEVROLET MALIBU CALIFORNIA WITH AIR PUMP

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	No Air Inj. + R.B.I.
Test No.	PVM	13	131	132	133	135
Barometer,	mm Hg	742.8	740.3	744.2	741.3	743.0
Humidity,	g/kg	9.2	9.3	8.7	8.5	8.6
Temperature,	°C	24.0	25.0	22.5	25.3	23.3
Total Fuel Sulfur,	mg/km	28.78	31.71	29.32	24.96	28.24
Avg. Exh. Oxygen,	%	4.68	3.00	4.68	5.20	0.61
Catalyst Avg. Temp.,	°C	598.	703.	698.	509.	535.
Catalyst Max. Temp.,	°C	690.	757.	818.	608.	671.
Carbon Dioxide,	g/km	316.7	355.9	319.3	272.7	270.1
Fuel Cons.,	ℓ/100 km	13.58	15.33	13.69	11.65	13.28
Regulated Emissions						
Hydrocarbons (THC),	g/km	0.05	0.03	0.16	0.03	0.48
Carbon Monoxide,	g/km	0.75	1.95	0.51	0.06	23.64
Oxides of Nitrogen,	g/km	0.35	0.33	0.51	1.38	0.25
Particulates						
Total Particulates		4.66	5.15	3.89	29.58	6.89
Sulfate		2.75	2.51	2.78	16.95	0.08
Compound Group Totals						
Aldehydes & Ketones		1.0	2.8	1.4	2.8	5.8
Individual Hydrocarbons		27.	23.	--	15.	--
Organic Sulfides		0.09	--	0.14	0.03	2.06
Organic Amines		0.00	0.04	0.01	0.00	0.00
Other Compounds						
Ammonia		1.74	1.93	--	--	--
Cyanide & Cyanogen		0.03	0.07	0.09	0.09	0.69
DMNA		--	--	--	--	--
Hydrogen Sulfide		0.00	0.80	0.00	0.00	4.26
Nickel Carbonyl		0.00	0.00	--	--	--
Nitrous Oxide		3.	1.7	3.	4.	3.
Aldehydes and Ketones						
Formaldehyde		0.41	0.30	1.03	2.18	0.52
Acetaldehyde		0.33	0.41	0.16	0.00	2.25
Acetone		0.13	1.31	0.14	0.02	0.97
Isobutyraldehyde		0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone		0.06	0.39	0.03	0.09	1.78
Crotonaldehyde		--	--	--	--	--
Hexanaldehyde		0.05	0.35	0.04	0.47	0.24
Benzaldehyde		--	--	--	--	--

TABLE G-8 (Cont'd). CAR 13 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - SET
1978 CHEVROLET MALIBU CALIFORNIA WITH AIR PUMP

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	No Air Inj. + R.B.I.
Individual Hydrocarbons						
Methane		22.	17.5	--	7.	--
Ethylene		2.	1.2	--	1.	--
Ethane		3.	1.2	--	1.	--
Acetylene		0.	0.0	--	0.	--
Propane		0.	--	--	0.	--
Propylene		0.	--	--	0.	--
Benzene		0.	1.0	--	1.	--
Toluene		0.	2.6	--	5.	--
Organic Sulfides						
Carbonyl Sulfide		0.02	--	0.01	0.01	2.03
Methyl Sulfide		0.02	--	0.10	0.02	0.03
Ethyl Sulfide		0.05	--	0.04	0.00	0.00
Methyl Disulfide		0.00	--	0.00	0.00	0.01
Organic Amines						
Monomethylamine		0.00	0.01	0.01	0.00	0.00
Monoethylamine		0.00	0.04	0.00	0.00	0.00
Trimethylamine		0.00	0.00	0.00	0.00	0.00
Diethylamine		0.00	0.00	0.00	0.00	0.00
Triethylamine		0.00	0.00	0.00	0.00	0.00
Other Elements [a]						
Manganese	Mn					
Phosphorus	P				0.01	
Silicon	Si				0.01	
Aluminum	Al	0.01	0.01	0.01	0.01	0.01
Sulfur	S	1.13	1.06	1.13	5.55	0.03
Sodium	Na					
Magnesium	Mg					
Potassium	K					
Chlorine	Cl			0.01		
Zinc	Zn					
Copper	Cu					
Nickel	Ni					
Iron	Fe	0.01	0.04	0.05		
Barium	Ba	0.01	0.01	0.01	0.01	0.01
Calcium	Ca					

*Validity of the average value given is questionable.

[a] This table excludes lead, bromine and all elements having measured emissions values consistently below 0.01 mg/km.

Note: For Other Elements, a blank space indicates a 0.00 value.

TABLE G-9. CAR 13 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - HFET

1978 CHEVROLET MALIBU CALIFORNIA WITH AIR PUMP

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	No Air Inj. + R.B.I.
Test No.	PVM	13	131	132	133	135
Barometer,	mm Hg	742.8	740.4	744.2	742.2	743.0
Humidity,	g/kg	9.1	9.2	8.1	9.1	8.3
Temperature,	°C	25.4	25.3	24.4	26.1	23.4
Total Fuel Sulfur,	mg/km	24.50	26.94	25.04	21.09	23.79
Avg. Exh. Oxygen,	%	4.28	3.73	4.31	5.02	0.35
Catalyst Avg. Temp.,	°C	612.	635.	731.	530.	613.
Catalyst Max. Temp.,	°C	672.	711.	798.	584.	674.
Carbon Dioxide,	g/km	270.1	304.5	273.1	230.4	244.9
Fuel Cons.,	ℓ/100 km	11.55	13.02	11.69	9.84	11.10
Regulated Emissions						
Hydrocarbons (THC),	g/km	0.04	0.04	0.09	0.03	0.16
Carbon Monoxide,	g/km	0.21	0.32	0.24	0.03	9.30
Oxides of Nitrogen,	g/km	0.42	0.49	0.56	1.78	0.26
Particulates						
Total Particulates		4.09	--	1.83	17.72	4.30
Sulfate		2.59	1.56	2.18	13.81	0.11
Compound Group Totals						
Aldehydes & Ketones		1.1	2.4	4.1	6.0	2.7
Individual Hydrocarbons		30.0	33.	--	14.	--
Organic Sulfides		0.08	--	0.12	0.00	1.03
Organic Amines		0.00	0.05	0.00	0.00	0.00
Other Compounds						
Ammonia		2.09	1.10	--	--	--
Cyanide & Cyanogen		0.10	0.19	0.07	0.05	0.29
DMNA		--	--	--	--	--
Hydrogen Sulfide		0.00	0.00	0.00	0.00	1.12
Nickel Carbonyl		0.00	0.00	--	--	--
Nitrous Oxide		2.	1.9	3.	7.	3.
Aldehydes and Ketones						
Formaldehyde		0.59	0.66	2.84	4.54	0.46
Acetaldehyde		0.27	0.24	0.91	0.00	1.41
Acetone		0.07	0.14	0.21	0.07	0.31
Isobutyraldehyde		0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone		0.08	0.68	0.07	0.04	0.18
Crotonaldehyde		--	--	--	--	--
Hexanaldehyde		0.06	0.64	0.10	1.35	0.32
Benzaldehyde		--	--	--	--	--

TABLE G-9 (Cont'd). CAR 13 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - HFET
1978 CHEVROLET MALIBU CALIFORNIA WITH AIR PUMP

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	No Air Inj. + R.B.I.
Individual Hydrocarbons						
Methane		22.	23.1	--	6.	--
Ethylene		3.	3.6	--	1.	--
Ethane		3.	3.0	--	1.	--
Acetylene		0.	0.0	--	0.	--
Propane		1.	--	--	0.	--
Propylene		0.	--	--	0.	--
Benzene		0.	0.6	--	1.	--
Toluene		1.	2.5	--	5.	--
Organic Sulfides						
Carbonyl Sulfide		0.01	--	0.02	0.00	1.00
Methyl Sulfide		0.02	--	0.04	0.00	0.01
Ethyl Sulfide		0.05	--	0.06	0.00	0.01
Methyl Disulfide		0.00	--	0.01	0.00	0.02
Organic Amines						
Monomethylamine		0.00	0.02	0.00	0.00	0.00
Monoethylamine		0.00	0.03	0.00	0.00	0.00
Trimethylamine		0.00	0.00	0.00	0.00	0.00
Diethylamine		0.00	0.00	0.00	0.00	0.00
Triethylamine		0.00	0.00	0.00	0.00	0.00
Other Elements[a]						
Manganese	Mn		--		--	
Phosphorus	P		--		--	
Silicon	Si		--		--	
Aluminum	Al		--		--	
Sulfur	S	1.16	--	0.90	--	0.01
Sodium	Na		--		--	
Magnesium	Mg		--		--	
Potassium	K		--		--	
Chlorine	Cl		--		--	
Zinc	Zn		--		--	
Copper	Cu		--		--	
Nickel	Ni		--		--	
Iron	Fe		--	0.02	--	
Barium	Ba	0.01	--		--	
Calcium	Ca		--		--	

*Validity of the average value given is questionable.

[a] This table excludes lead, bromine and all elements having measured emissions values consistently below 0.01 mg/km.

Note: For Other Elements, a blank space indicates a 0.00 value.

TABLE G-10. CAR 14 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - FTP
1978 FORD GRANADA - 49 STATE

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	No Air Inj. + R.B.I.
Test No.	PVM	14	141	142	143	145
Barometer,	mm Hg	741.4	740.1	742.1	742.9	737.1
Humidity,	g/kg	10.5	10.7	11.1	9.1	10.9
Temperature,	°C	23.3	24.2	22.2	22.2	22.3
Total Fuel Sulfur,	mg/km	32.6	36.81	34.42	33.27	35.15
Avg. Exh. Oxygen,	%	5.24	4.70	4.93	4.05	5.55
Catalyst Avg. Temp.,	°C	382.	556.	504.	346.	355.
Catalyst Max. Temp.,	°C	462.	662.	625.	427.	460.
Carbon Dioxide,	g/km	353.5	369.5	367.9	359.5	297.6
Fuel Cons.,	ℓ/100 km	15.22	17.18	16.06	15.52	16.40
Regulated Emissions						
Hydrocarbons (THC),	g/km	0.27	0.62	1.65	0.36	2.26
Carbon Monoxide,	g/km	1.48	19.70	2.00	1.94	50.62
Oxides of Nitrogen,	g/km	1.22	0.62	1.70	4.13	0.61
Particulates						
Total Particulates		7.6	3.0	12.7	10.2	17.9
Sulfate		1.15	0.28	0.16	0.26	4.58
Compound Group Totals						
Aldehydes & Ketones		3.4	2.5	9.5	7.1	0.9
Individual Hydrocarbons		97.	300.	--	138.	--
Organic Sulfides		0.11	0.03	0.04	0.02	0.79
Organic Amines		0.03	0.08	0.01	0.03	0.00
Other Compounds						
Ammonia		1.93	21.40	3.70	3.77	--
Cyanide & Cyanogen		0.23	0.98	0.16	1.45	--
DMNA		--	--	--	--	--
Hydrogen Sulfide		0.00	0.26	0.00	0.00	0.69
Nickel Carbonyl		0.00	0.00	--	--	--
Nitrous Oxide		21.	9.8	--	60.5	14.
Aldehydes and Ketones						
Formaldehyde		2.89	1.33	4.38	5.02	0.33
Acetaldehyde		0.14	0.63	3.21	0.00	0.31
Acetone		0.05	0.16	1.17	0.00	0.04
Isobutyraldehyde		0.00	0.00	0.03	0.00	0.00
Methyl Ethyl Ketone		0.17	0.07	0.49	0.00	0.00
Crotonaldehyde		--	--	--	--	--
Hexanaldehyde		0.15	0.26	0.18	2.07	0.23
Benzaldehyde		--	--	--	--	--

TABLE G-10 (Cont'd). CAR 14 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - FTP
1978 FORD GRANADA - 49 STATE

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	No Air Inj. + R.B.I.
Individual Hydrocarbons						
Methane		37.	133.5	--	37.	--
Ethylene		12.	36.9	--	23.	--
Ethane		14.	18.2	--	11.	--
Acetylene		0.	0.8	--	1.	--
Propane		1.	2.1	--	0.	--
Propylene		5.	12.2	--	13.	--
Benzene		8.	68.4	--	15.	--
Toluene		21.	27.7	--	38.	--
Organic Sulfides						
Carbonyl Sulfide		0.04	0.00	--	0.01	0.67
Methyl Sulfide		0.03	0.03	0.03	0.01	0.05
Ethyl Sulfide		0.04	0.01	0.00	0.00	0.07
Methyl Disulfide		0.00	0.00	0.00	0.00	0.01
Organic Amines						
Monomethylamine		0.00	0.06	0.01	0.01	0.00
Monoethylamine		0.00	0.02	0.00	0.02	0.01
Trimethylamine		0.00	0.00	0.01	0.00	0.00
Diethylamine		0.00	0.00	0.00	0.00	0.00
Triethylamine		0.00	0.00	0.00	0.00	0.00
Other Elements[a]						
Manganese	Mn					--
Phosphorus	P	0.02	0.01	0.02		--
Silicon	Si					--
Aluminum	Al	0.01				--
Sulfur	S	0.16	0.02	0.09	0.03	--
Sodium	Na					--
Magnesium	Mg	0.01		0.01		--
Potassium	K					--
Chlorine	Cl	0.02	0.01	0.01	--	--
Zinc	Zn	0.01		0.03		--
Copper	Cu					--
Nickel	Ni					--
Iron	Fe	0.42	0.15	0.27	0.04	--
Barium	Ba	0.03	0.01	0.04	0.01	--
Calcium	Ca		0.02	0.01		--

*Validity of the average value given is questionable.

[a] This table excludes lead, bromine and all elements having measured emissions values consistently below 0.01 mg/km.

For Other Elements, a blank space indicates a 0.00 value.

TABLE G-11. CAR 14 AVERAGE RESULTS FOR THE UMMODIFIED AND THE
MALFUNCTION CONFIGURATIONS - SET
1978 FORD GRANADA - 49 STATE

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	No Air Inj. + R.B.I.
Test No.	PVM	14	141	142	143	145
Barometer,	mm Hg	740.5	739.5	742.7	742.1	739.0
Humidity,	g/kg	9.5	9.8	9.1	8.7	11.2
Temperature,	°C	24.2	23.9	22.2	23.9	23.1
Total Fuel Sulfur,	mg/km	25.42	27.18	26.94	26.22	25.5
Avg. Exh. Oxygen,	%	4.52	3.80	4.19	3.06	4.15
Catalyst Avg. Temp.,	°C	463.	577.	596.	435.	450.
Catalyst Max. Temp.,	°C	549.	678.	685.	525.	546.
Carbon Dioxide,	g/km	277.1	290.0	292.1	286.1	250.7
Fuel Cons.,	ℓ/100 km	11.86	12.69	12.57	12.24	11.90
Regulated Emissions						
Hydrocarbons (THC),	g/km	0.09	0.16	0.52	0.08	0.82
Carbon Monoxide,	g/km	0.36	4.23	0.51	0.24	16.18
Oxides of Nitrogen,	g/km	0.94	0.68	1.19	5.13	0.70
Particulates						
Total Particulates		4.69	1.96	5.55	10.28	3.91
Sulfate		3.78	0.13	0.53	4.50	0.36
Compound Group Totals						
Aldehydes & Ketones		2.2	1.2	7.3	4.9	0.1
Individual Hydrocarbons		49.9	104.9	--	16.0	--
Organic Sulfides		0.07	0.04	0.03	0.15	1.04
Organic Amines		0.00	0.04	0.02	0.01	0.00
Other Compounds						
Ammonia		0.8 *	13.5	--	--	--
Cyanide & Cyanogen		0.02	0.06	0.03	0.06	--
DMNA		--	--	--	--	--
Hydrogen Sulfide		0.01	0.36	0.00	0.00	3.12
Nickel Carbonyl		0.00	0.00	--	--	--
Nitrous Oxide		9.	5.5	--	11.8	6.
Aldehydes and Ketones						
Formaldehyde		1.33	0.75	3.81	3.45	0.00
Acetaldehyde		0.27	0.15	2.35	0.00	0.00
Acetone		0.43	0.05	0.65	0.00	0.00
Isobutyraldehyde		0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone		0.08	0.04	0.34	0.06	0.00
Crotonaldehyde		--	--	--	--	--
Hexanaldehyde		0.12	0.14	0.12	1.39	0.06
Benzaldehyde		--	--	--	--	--

TABLE G-11 (Cont'd). CAR 14 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - SET
1978 FORD GRANADA - 49 STATE

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	No Air Inj. + R.B.I.
Individual Hydrocarbons						
Methane		21.5	59.3	--	16.	--
Ethylene		5.7	9.4	--	2.	--
Ethane		9.7	11.1	--	6.	--
Acetylene		0.0	0.0	--	3.	--
Propane		0.3	1.1	--	0.	--
Propylene		2.5	2.8	--	0.	--
Benzene		2.9	16.5	--	2.	--
Toluene		6.9	4.3	--	--	--
Organic Sulfides						
Carbonyl Sulfide		0.02	0.00	0.00	0.14	0.89
Methyl Sulfide		0.02	0.02	0.02	0.01	0.06
Ethyl Sulfide		0.03	0.02	0.01	0.01	0.09
Methyl Disulfide		0.00	0.00	0.00	0.00	0.01
Organic Amines						
Monomethylamine		0.00	0.02	0.00	0.01	0.00
Monoethylamine		0.00	0.02	0.01	0.00	0.00
Trimethylamine		0.00	0.00	0.01	0.00	0.00
Diethylamine		0.00	0.00	0.00	0.00	0.00
Triethylamine		0.00	0.00	0.00	0.00	0.00
Other Elements[a]						
Manganese	Mn					
Phosphorus	P	0.01	0.01	0.02	0.01	
Silicon	Si			0.01	0.01	
Aluminum	Al					
Sulfur	S	1.33	0.02	0.20	1.72	0.03
Sodium	Na					
Magnesium	Mg		0.01	0.01	0.01	
Potassium	K					
Chlorine	Cl		0.01			
Zinc	Zn					
Copper	Cu					
Nickel	Ni					
Iron	Fe	0.05	0.07	0.17	0.07	0.02
Barium	Ba	0.02	0.02	0.03	0.03	0.01
Calcium	Ca		0.01			

*Validity of the average value given is questionable.

[a] This table excludes lead, bromine and all elements having measured emissions values consistently below 0.01 mg/km.

Note: For Other Elements, a blank space indicates a 0.00 value.

TABLE G-12. CAR 14 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - HFET
1978 FORD GRANADA - 49 STATE

	Average Emission Rate, mg/km (Except as Noted)				
	Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	No Air Inj. + R.B.I.
Test No. PVM	14	141	142	143	145
Barometer, mm Hg	740.5	736.6	742.7	742.1	739.0
Humidity, g/kg	9.2	10.7	9.2	8.8	9.1
Temperature, °C	24.7	24.5	23.6	25.3	23.9
Total Fuel Sulfur, mg/km	22.53	23.41	23.42	22.67	22.08
Avg. Exh. Oxygen, %	3.29	3.15	3.11	1.67	2.23
Catalyst Avg. Temp., °C	495.	550.	632.	478.	509.
Catalyst Max. Temp., °C	552.	638.	691.	531.	552.
Carbon Dioxide, g/km	245.7	253.0	254.4	247.5	236.1
Fuel Cons., ℓ/100 km	10.51	10.92	10.93	10.58	10.30
Regulated Emissions					
Hydrocarbons (THC), g/km	0.07	0.15	0.39	0.07	0.23
Carbon Monoxide, g/km	0.25	1.56	0.27	0.12	2.88
Oxides of Nitrogen, g/km	0.85	0.84	1.04	4.88	0.83
Particulates					
Total Particulates	10.81	1.46	6.46	12.87	1.66
Sulfate	8.46	0.20	0.83	9.00	0.25
Compound Group Totals					
Aldehydes & Ketones	1.8	1.5	9.0	6.0	0.1
Individual Hydrocarbons	44.	59.	--	25.	--
Organic Sulfides	0.07	0.05	0.01	0.03	0.65
Organic Amines	0.00	0.01	0.01	0.00	0.00
Other Compounds					
Ammonia	0.8 *	4.6	--	--	--
Cyanide & Cyanogen	0.06	0.05	0.13	0.12	--
DMNA	--	--	--	--	--
Hydrogen Sulfide	0.01	0.00	0.00	0.00	1.42
Nickel Carbonyl	0.00	0.00	--	--	--
Nitrous Oxide	4.	3.4	--	6.4	4.
Aldehydes and Ketones					
Formaldehyde	0.85	0.66	5.60	4.50	0.00
Acetaldehyde	0.12	0.00	2.47	0.00	0.00
Acetone	0.63	0.00	0.50	0.00	0.06
Isobutyraldehyde	0.00	0.69	0.00	0.00	0.00
Methyl Ethyl Ketone	0.13	0.00	0.28	0.00	0.00
Crotonaldehyde	--	--	--	--	--
Hexanaldehyde	0.10	0.09	0.13	1.48	0.04
Benzaldehyde	--	--	--	--	--

TABLE G-12 (Cont'd). CAR 14 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - HFET
1978 FORD GRANADA - 49 STATE

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	No Air Inj. + R.B.I.
Individual Hydrocarbons						
Methane		20.	30.2	--	15.	--
Ethylene		3.	4.9	--	2.	--
Ethane		9.	11.0	--	5.	--
Acetylene		0.	0.1	--	0.	--
Propane		0.	1.1	--	2.	--
Propylene		2.	1.8	--	0.	--
Benzene		4.	4.3	--	1.	--
Toluene		5.	5.8	--	1.	--
Organic Sulfides						
Carbonyl Sulfide		0.01	0.00	0.00	0.01	0.53
Methyl Sulfide		0.04	0.04	0.01	0.01	0.06
Ethyl Sulfide		0.03	0.01	0.01	0.01	0.07
Methyl Disulfide		0.00	0.00	0.00	0.00	0.01
Organic Amines						
Monomethylamine		0.00	0.00	0.00	0.00	0.00
Monoethylamine		0.00	0.01	0.00	0.00	0.00
Trimethylamine		0.00	0.00	0.01	0.00	0.00
Diethylamine		0.00	0.00	0.00	0.00	0.00
Triethylamine		0.00	0.00	0.00	0.00	0.00
Other Elements[a]						
Manganese	Mn					
Phosphorus	P			0.01	0.01	
Silicon	Si			0.01		
Aluminum	Al					
Sulfur	S	3.39	0.05	0.29	3.45	0.04
Sodium	Na					
Magnesium	Mg			0.01		
Potassium	K					
Chlorine	Cl					
Zinc	Zn				0.02	
Copper	Cu					
Nickel	Ni					
Iron	Fe	0.04		0.07	0.05	
Barium	Ba	0.02	0.02	0.03	0.03	0.02
Calcium	Ca	0.01		0.03		

*Validity of the average value given is questionable.

[a] This table excludes lead, bromine and all elements having measured emissions values consistently below 0.01 mg/km.

Note: For Other Elements, a blank space indicates a 0.00 value.

TABLE G-13. CAR 15 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - FTP
1978 FORD MUSTANG II - 49 STATE

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	High Oil Consump.
Test No.	PVM	15	151	152	153	154
Barometer,	mm Hg	741.0	739.3	741.7	742.7	741.6
Humidity,	g/kg	10.1	10.2	9.7	11.9	10.8
Temperature,	°C	22.4	24.5	22.5	23.1	23.1
Total Fuel Sulfur,	mg/km	29.79	36.90	35.86	32.44	33.04
Avg. Exh. Oxygen,	%	4.21	3.70	3.35	3.66	3.58
Catalyst Avg. Temp.,	°C	450.	435.	563.	415.	473.
Catalyst Max. Temp.,	°C	580.	586.	730.	524.	600.
Carbon Dioxide,	g/km	343.5	322.4	380.8	349.6	350.7
Fuel Cons.,	ℓ/100 km	14.93	17.22	16.73	15.14	15.42
Regulated Emissions						
Hydrocarbons (THC),	g/km	0.32	2.24	1.61	0.33	0.48
Carbon Monoxide,	g/km	3.34	47.03	3.92	2.57	5.71
Oxides of Nitrogen,	g/km	1.02	0.75	1.26	4.15	0.87
Particulates						
Total Particulates		5.76	9.38	7.15	8.71	10.90
Sulfate		0.59	0.26	0.14	0.23	9.39
Compound Group Totals						
Aldehydes & Ketones		2.7	4.5	4.5	6.2	1.9
Individual Hydrocarbons		135.	987.	149.	--	--
Organic Sulfides		0.27	--	0.21	0.03	0.58
Organic Amines		0.01	0.11	0.01	0.05	0.01
Other Compounds						
Ammonia		3.06	56.64	9.54	2.44	--
Cyanide & Cyanogen		0.48	6.15	0.84	0.56	--
DMNA		--	--	--	--	--
Hydrogen Sulfide		0.11	0.57	0.00	0.00	0.00
Nickel Carbonyl		--	0.00	--	--	--
Nitrous Oxide		27.*	45.0	--	--	--
Aldehydes and Ketones						
Formaldehyde		1.58	2.23	2.65	3.74	0.59
Acetaldehyde		0.63	1.88	1.45	0.09	0.90
Acetone		0.15	0.20	0.22	0.21	0.09
Isobutyraldehyde		0.03	0.00	0.00	0.00	0.02
Methyl Ethyl Ketone		0.13	0.02	0.09	0.50	0.12
Crotonaldehyde		--	--	--	--	--
Hexanaldehyde		0.18	0.21	0.05	1.68	0.11
Benzaldehyde		--	--	--	--	--

TABLE G-13 (Cont'd). CAR 15 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - FTP
1978 FORD MUSTANG II - 49 STATE

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	High Oil Consump.
Individual Hydrocarbons						
Methane		45.	257.4	39.	--	--
Ethylene		24.	301.8	9.	--	--
Ethane		8.	48.0	6.	--	--
Acetylene		0.	1.3	0.	--	--
Propane		2.	7.4	16.	--	--
Propylene		12.	78.8	4.	--	--
Benzene		14.	118.3	37.	--	--
Toluene		29.	174.2	38.	--	--
Organic Sulfides						
Carbonyl Sulfide		0.16	--	0.20	0.01	0.50
Methyl Sulfide		0.11	0.03	0.01	0.02	0.05
Ethyl Sulfide		0.01	0.20	0.00	0.00	0.04
Methyl Disulfide		0.00	0.04	0.00	0.00	0.00
Organic Amines						
Monomethylamine		0.01	0.03	0.00	0.04	0.00
Monoethylamine		0.00	0.08	0.01	0.00	0.00
Trimethylamine		0.00	0.00	0.00	0.01	0.01
Diethylamine		0.00	0.00	0.00	0.00	0.00
Triethylamine		0.00	0.00	0.00	0.00	0.00
Other Elements [a]						
Manganese	Mn					
Phosphorus	P	0.01	0.01		0.01	0.35
Silicon	Si					0.02
Aluminum	Al					0.01
Sulfur	S	0.05	0.02	0.07	0.02	0.08
Sodium	Na					
Magnesium	Mg	0.01		0.01		0.22
Potassium	K					0.03
Chlorine	Cl	0.03		0.02		0.18
Zinc	Zn			0.02		0.28
Copper	Cu			0.03		
Nickel	Ni					
Iron	Fe	0.27	0.15	0.85	0.09	0.22
Barium	Ba	0.02	0.01	0.03	0.02	0.60
Calcium	Ca					0.07

*Validity of the average value given is questionable.

[a] This table excludes lead, bromine and all elements having measured emissions values consistently below 0.01 mg/km.

Note: For Other Elements, a blank space indicates a 0.00 value.

TABLE G-14. CAR 15 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - SET
1978 FORD MUSTANG II - 49 STATE

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	High Oil Consump.
Test No.	PVM	15	151	152	153	154
Barometer,	mm Hg	741.0	738.6	740.3	742.3	741.8
Humidity,	g/kg	8.8	10.2	12.6	9.2	10.3
Temperature,	°C	24.2	23.9	24.2	22.8	23.3
Total Fuel Sulfur,	mg/km	24.92	28.10	26.97	26.36	26.48
Avg. Exh. Oxygen,	%	3.22	2.58	2.86	2.88	2.65
Catalyst Avg. Temp.,	°C	548.	536.	687.	496.	560.
Catalyst Max. Temp.,	°C	646.	665.	776.	612.	663.
Carbon Dioxide,	g/km	285.6	279.9	290.3	287.4	285.
Fuel Cons.,	ℓ/100 km	12.25	13.11	12.59	12.30	12.36
Regulated Emissions						
Hydrocarbons (THC),	g/km	0.10	0.81	0.50	0.08	0.19
Carbon Monoxide,	g/km	0.72	15.72	1.89	0.31	2.45
Oxides of Nitrogen,	g/km	0.95	0.82	1.31	4.63	0.92
Particulates						
Total Particulates		3.19	2.73	2.83	5.77	6.69
Sulfate		0.50	0.15	0.05	0.75	0.26
Compound Group Totals						
Aldehydes & Ketones		0.8	0.9	2.0	6.3	0.8
Individual Hydrocarbons		51.	384.	--	--	--
Organic Sulfides		0.20	--	--	0.04	0.26
Organic Amines		0.02	0.06	0.01	0.01	0.00
Other Compounds						
Ammonia		3.1 *	29.0	--	--	--
Cyanide & Cyanogen		0.04	1.99	0.25	0.00	--
DMNA		--	--	--	--	--
Hydrogen Sulfide		0.09	2.37	0.00	0.03	0.16
Nickel Carbonyl		0.00	0.00	--	--	--
Nitrous Oxide		20.	22.0	--	--	--
Aldehydes and Ketones						
Formaldehyde		0.48	0.41	1.33	4.08	0.28
Acetaldehyde		0.10	0.18	0.43	0.00	0.21
Acetone		0.08	0.00	0.00	0.02	0.23
Isobutyraldehyde		0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone		0.04	0.10	0.06	0.22	0.05
Crotonaldehyde		--	--	--	--	--
Hexanaldehyde		0.05	0.13	0.20	2.00	0.09
Benzaldehyde		--	--	--	--	--

TABLE G-14 (Cont'd). CAR 15 AVERAGE RESULTS FOR THE UNMODIFIED AND THE
MALFUNCTION CONFIGURATIONS - SET
1978 FORD MUSTANG II - 49 STATE

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	High Oil Consump.
Individual Hydrocarbons						
Methane		25.	98.8	--	--	--
Ethylene		3.	101.8	--	--	--
Ethane		7.	20.0	--	--	--
Acetylene		0.	0.0	--	--	--
Propane		1.	3.5	--	--	--
Propylene		1.	34.9	--	--	--
Benzene		4.	56.6	--	--	--
Toluene		9.	68.0	--	--	--
Organic Sulfides						
Carbonyl Sulfide		0.08	--	--	0.01	0.19
Methyl Sulfide		0.09	0.02	--	0.03	0.02
Ethyl Sulfide		0.03	0.09	--	0.00	0.05
Methyl Disulfide		0.00	0.09	--	0.00	0.00
Organic Amines						
Monomethylamine		0.00	0.02	0.01	0.00	0.00
Monoethylamine		0.01	0.04	0.01	0.00	0.00
Trimethylamine		0.00	0.00	0.00	0.01	0.00
Diethylamine		0.00	0.00	0.00	0.00	0.00
Triethylamine		0.00	0.00	0.00	0.00	0.00
Other Elements [a]						
Manganese	Mn					
Phosphorus	P		0.01			0.27
Silicon	Si			0.01		0.01
Aluminum	Al					
Sulfur	S	0.15	0.03	0.02	0.52	0.07
Sodium	Na					
Magnesium	Mg					0.17
Potassium	K					0.01
Chlorine	Cl	0.01		0.01		0.14
Zinc	Zn					0.22
Copper	Cu					
Nickel	Ni					
Iron	Fe	0.04	0.07	0.07	0.04	0.06
Barium	Ba	0.02	0.02	0.01	0.02	0.51
Calcium	Ca			0.02		0.01

*Validity of the average value given is questionable.

[a] This table excludes lead, bromine and all elements having measured emissions values consistently below 0.01 mg/km.

Note: For Other Elements, a blank space indicates a 0.00 value.

TABLE G-15. CAR 15 AVERAGE RESULTS FOR THE UNMODIFIED AND THE MALFUNCTION CONFIGURATIONS - HFET
1978 FORD MUSTANG II - 49 STATE

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	High Oil Consump.
Test No.	PVM	15	151	152	153	154
Barometer,	mm Hg	740.9	739.1	740.3	742.3	741.8
Humidity,	g/kg	9.4	9.7	13.0	8.7	10.2
Temperature,	°C	24.3	26.4	26.1	24.7	26.1
Total Fuel Sulfur,	mg/km	22.72	24.95	24.60	23.26	23.39
Avg. Exh. Oxygen,	%	1.67	1.48	1.64	1.29	1.10
Catalyst Avg. Temp.,	°C	609.	576.	735.	566.	619.
Catalyst Max. Temp.,	°C	663.	669.	787.	634.	681.
Carbon Dioxide,	g/km	260.4	266.9	267.4	253.8	253.8
Fuel Cons.,	ℓ/100 km	11.15	11.64	11.48	10.85	10.92
Regulated Emissions						
Hydrocarbons (THC),	g/km	0.07	0.31	0.29	0.05	0.09
Carbon Monoxide,	g/km	0.36	3.12	0.41	0.20	1.02
Oxides of Nitrogen,	g/km	0.93	0.92	0.62	4.36	0.75
Particulates						
Total Particulates		2.33	2.11	1.37	4.75	3.32
Sulfate		0.66	0.21	0.04	1.68	0.23
Compound Group Totals						
Aldehydes & Ketones		1.3	1.8	5.9	3.5	1.1
Individual Hydrocarbons		35.	155.	--	--	--
Organic Sulfides		0.15	--	0.13	0.01	0.09
Organic Amines		0.06	--	0.01	0.00	0.01
Other Compounds						
Ammonia		2.4 *	8.6	--	--	--
Cyanide & Cyanogen		0.06	0.24	0.31	0.00	--
DMNA		--	--	--	--	--
Hydrogen Sulfide		0.37	0.81	0.00	0.03	0.12
Nickel Carbonyl		0.00	0.00	--	--	--
Nitrous Oxide		16.	7.3	--	--	--
Aldehydes and Ketones						
Formaldehyde		0.35	0.66	4.55	2.48	0.05
Acetaldehyde		0.41	0.75	1.15	0.00	0.42
Acetone		0.13	0.00	0.00	0.00	0.22
Isobutyraldehyde		0.00	0.00	0.00	0.00	0.00
Methyl Ethyl Ketone		0.12	0.18	0.08	0.20	0.00
Crotonaldehyde		--	--	--	--	--
Hexanaldehyde		0.29	0.13	0.05	0.73	0.33
Benzaldehyde		--	--	--	--	--

TABLE G-15 (Cont'd). CAR 15 AVERAGE RESULTS FOR THE UNMODIFIED AND THE
MALFUNCTION CONFIGURATIONS - HFET
1978 FORD MUSTANG II - 49 STATE

		Average Emission Rate, mg/km (Except as Noted)				
		Unmod.	Rich Best Idle	12% Misfire	Disabled EGR	High Oil Consump.
Individual Hydrocarbons						
Methane		21.	49.4	--	--	--
Ethylene		1.	27.2	--	--	--
Ethane		6.	11.8	--	--	--
Acetylene		0.	0.0	--	--	--
Propane		1.	3.2	--	--	--
Propylene		0.	10.8	--	--	--
Benzene		2.	25.8	--	--	--
Toluene		4.	27.3	--	--	--
Organic Sulfides						
Carbonyl Sulfide		0.07	--	0.13	0.00	0.07
Methyl Sulfide		0.01	0.15	0.00	0.01	0.02
Ethyl Sulfide		0.07	0.33	0.00	0.00	0.00
Methyl Disulfide		0.01	0.00	0.00	0.00	0.00
Organic Amines						
Monomethylamine		0.03	--	0.00	0.00	0.01
Monoethylamine		0.03	0.01	0.01	0.00	0.00
Trimethylamine		0.00	0.00	0.00	0.00	0.01
Diethylamine		0.00	0.00	0.00	0.00	0.00
Triethylamine		0.00	0.00	0.00	0.00	0.00
Other Elements[a]						
Manganese	Mn					
Phosphorus	P					0.19
Silicon	Si					
Aluminum	Al					
Sulfur	S	0.33	0.03	0.02	0.70	0.04
Sodium	Na					
Magnesium	Mg					0.14
Potassium	K					
Chlorine	Cl					0.08
Zinc	Zn					0.13
Copper	Cu					
Nickel	Ni					
Iron	Fe	0.02	0.04	0.02	0.07	0.03
Barium	Ba	0.01		0.01		0.37
Calcium	Ca					0.01

*Validity of the average value given is questionable.

[a] This table excludes lead, bromine and all elements having measured emissions values consistently below 0.01 mg/km.

Note: For Other Elements, a blank space indicates a 0.00 value.